



ARIZONA MILITARY REGIONAL COMPATIBILITY PROJECT



FORT HUACHUCA JOINT LAND USE STUDY

JUNE 2007



ARIZONA DEPARTMENT OF COMMERCE

FORT HUACHUCA

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PREPARED FOR:



ARIZONA DEPARTMENT OF COMMERCE

PREPARED BY:



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1. INTRODUCTION

In October 2006, a Joint Land Use Study (JLUS) for Fort Huachuca (or Fort) began under the sponsorship of the Arizona Department of Commerce (ADOC), and partially funded by a grant from the Department of Defense Office of Economic Adjustment. The Fort Huachuca JLUS is part of the Arizona Military Regional Compatibility Project (Compatibility Project), which was conceived as a proactive statewide endeavor to convene the stakeholders around each base — the relevant jurisdictions, base personnel, landowners, and other interested parties — to address land use compatibility issues. Arizona is home to a network of United States military airports and installations including Fort Huachuca, Luke Air Force Base, Yuma Proving Ground and Marine Corps Air Station (MCAS) Yuma, Davis-Monthan Air Force Base, the Western ARNG Aviation Training Site (WAATS) and the Barry M. Goldwater Range Complex (Figure 1-1). For each of the individual installation to sustain its mission, it needs not only to protect the capabilities of the installation itself, but also to protect the capability of the installation from incompatible use so that these facilities can continue to accommodate the necessary operations of the U.S. military.

As issues of growth and development continue to move to the forefront in many parts of Arizona, the installations and jurisdictions where the installations are located play key roles in addressing compatibility. Through the statewide Compatibility Project, the State is endeavoring to provide the tools to address land use conflicts that might affect the ability of each installation to conduct its mission, and to ensure land use compatibility around the state's military installations. The Fort Huachuca JLUS developed through a collaborative effort between the Fort, affected jurisdictions, community groups and other stakeholders that included a public informational meeting and broad participation of a Policy Advisory Committee (PAC) and Working Group.

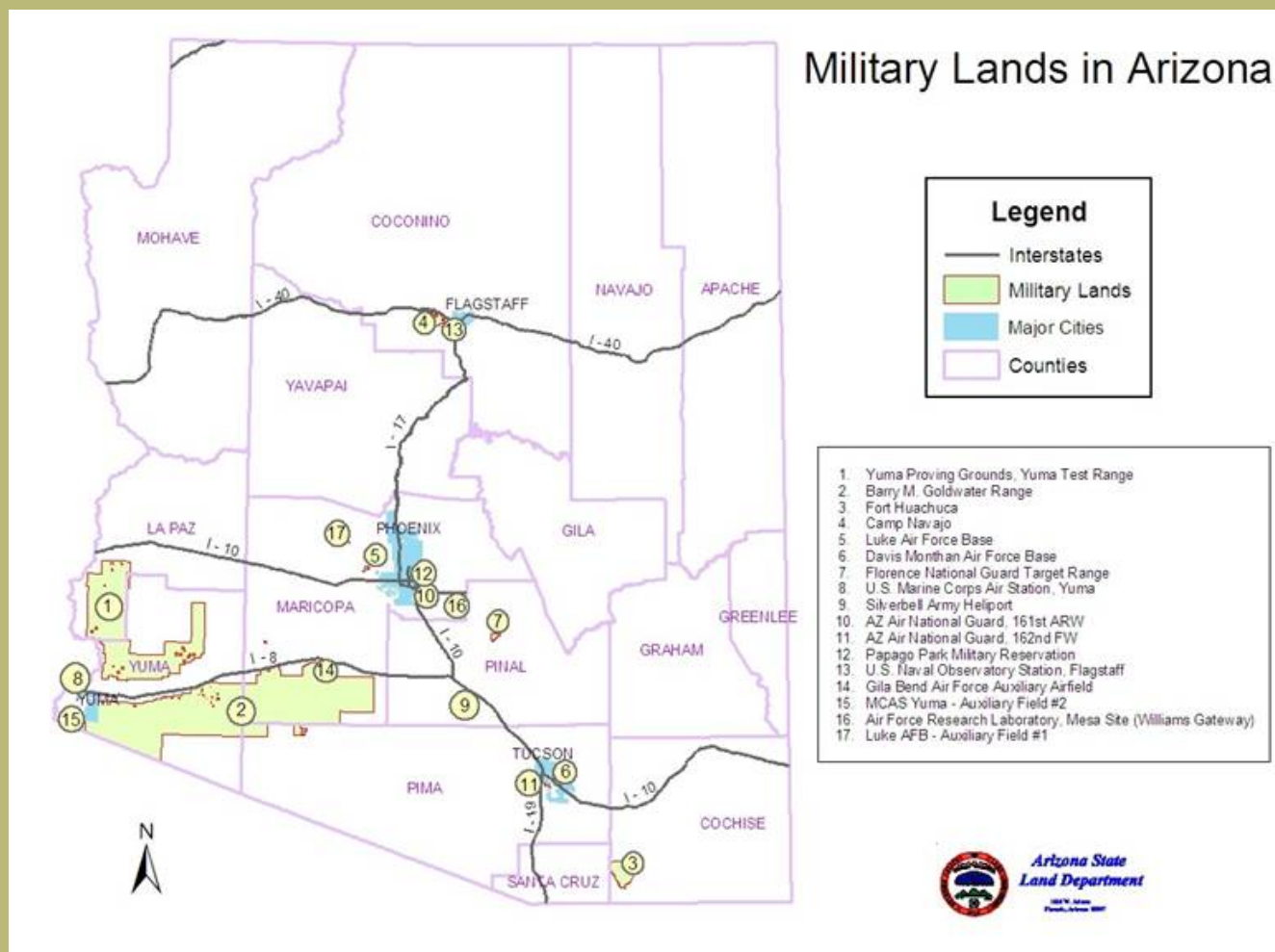
1.1 PROJECT PURPOSE

The purpose of the Fort Huachuca JLUS is to facilitate the implementation of compatible land uses in areas critical to the mission and operation of the Fort through a cooperative coordinated program among the affected jurisdictions in Cochise and Santa Cruz Counties that have the authority and responsibility to implement land use regulations for their communities, along with the Fort and other interested and affected parties, including institutions, corporations, and individuals. To accomplish this, the JLUS Program uses existing data to identify issues of land use compatibility and proposes specific and achievable implementation strategies based upon sound compatibility criteria.



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Source: Adopted from Arizona State Land Department

Figure 1-1: Military Lands in Arizona

1.2 PROJECT GOALS

To accomplish the purpose, the primary goals of this JLUS are:

- Compile and analyze existing plans and studies to identify critical development issues that affect the ability to prevent land use incompatibilities and encroachment;
- Identify approaches to land use compatibility that are acceptable and feasible in areas that are critical to the Fort's mission and operations;
- Provide opportunities for meaningful input by landowners, county and municipal governmental agencies, educational institutions, and other stakeholders;
- Develop an implementation plan based on defined compatibility criteria that recommends actions to prevent encroachment by incompatible development and its resulting impacts on military missions and sustainability;
- Identify existing and develop new land use planning and zoning tools, strategies, and techniques and develop new tools, strategies, and techniques that fairly allocate impacts of achieving land use compatibility with respect to federal, State, and local governments, private landowners, and the military.

As the Project Team met with local jurisdictions, the installation, residents, landowners, and other stakeholders, additional goals were identified:

- Define areas that are critical to the Fort's mission and operations, recognizing that these areas, particularly the Electronic Range and Restricted Airspace, extend beyond the immediate vicinity of the Fort's boundaries;
- Develop compatibility criteria that recognize the differences in compatibility criteria applicable to airfield operations at Libby Army Airfield and those applicable to other operations at Fort Huachuca, such as those involving the Electronic Range and Restricted Airspace.
- Develop compatibility approaches that address the lack of available information regarding electromagnetic interference and clear compatibility criteria.

1.3 GUIDING PRINCIPLES

The Arizona Military Regional Compatibility Project defined guiding principles for the compatibility planning process. These principles apply to each element and phase of the process.

- Create feasible and sustainable solutions that are consistent with Title 28, Article 7, Airport Zoning and Regulation and the Growing Smarter and Growing Smarter Plus legislation;
- Address areas within the vicinity of military airports in municipal general plans and county comprehensive plans to ensure development is compatible with the high-noise or accident potential generated by military airport operations, as defined under ARS §28-8481;
- Ensure openness to varying viewpoints throughout the process;

- Focus on fair and equitable solutions for all affected parties;
- Establish, maintain, and enhance consistency and continuity in the decision-making process;
- Achieve consent among the stakeholders on the means to control encroachment;
- Devise compatible land use solutions that accommodate urban development while preserving the operational capabilities of the installation.

1.4 PUBLIC PARTICIPATION

The public participation program provided opportunities for interested parties to contribute to shaping the outcome of the JLUS through the public outreach process. The vision for public participation was that no one interest dominated the public process, but that all stakeholders in the affected area and all other interested parties had access to frequent and timely progress reports, meaningful and convenient methods of participation, and timely access to draft documents in advance of public meetings.

To achieve this vision, the public participation program consisted of a variety of communication opportunities:

- Posting project information on the Arizona Department of Commerce website (<http://www.azcommerce.com>);
- Distributing project information to a mailing list of more than 450 community organizations, agencies, and individuals via monthly bulletins, e-mail notices, and direct mailings;
- Encouraging local media coverage of Military Compatibility Project achievements, milestones, and events through distribution of press releases and public service announcements;
- Providing for participation in the JLUS Policy Advisory Committee by key constituent groups, community organizations, Fort Huachuca representatives, and local political jurisdictions to provide input and policy direction;
- Conducting a Public Informational Meeting to provide residents and stakeholders an opportunity to receive information on issues and to provide input and comments in a comfortable environment;
- Distributing documents in hard copy, web, email, and data disc formats.

1.5 PLAN IMPLEMENTATION

The JLUS recommendations are the foundation for future action by a variety of public and private entities as it relates to compatible land use around the installation. The JLUS is designed to be implemented at several levels, including the State of Arizona and local political jurisdictions, and by cooperative efforts among local jurisdictions, Fort Huachuca and public / private partnerships. The implementation program for the JLUS is contained in Chapter 6.



2. STUDY AREA OVERVIEW

The study area for the Fort Huachuca JLUS is defined by two unique characteristics that are critical to the Fort's mission: 1) Electronic Range/Unique "Quiet Electromagnetic Environment;" 2) R2303 Special Use Restricted Airspace for Unmanned Aerial Vehicle (UAV) Training. Individual "focus areas" have been determined that reflect these two primary components of the Fort's mission, discussed in detail in section 3.2 of this document. Together, the Electronic Range and Restricted Airspace focus areas comprise the Fort Huachuca JLUS study area, an area of approximately 1,648,165 acres, depicted in Figure 2-1.

The study area includes multiple, local municipalities as well as federal and state owned land. Local jurisdictions within the study area include portions of Cochise and Santa Cruz County, as well as the City of Sierra Vista, Huachuca City, and the Cities of Tombstone, Benson. Federal property ownership within the study area includes that of the U.S. Army (Fort Huachuca), the U.S. Forest Service (USFS), National Park Service (NPS), and Bureau of Land Management (BLM). Major State property ownership within the study area includes that of the Arizona State Land Department, and Arizona State Parks (ASP).

This Chapter presents an overview of the existing conditions in the study area broken down by local jurisdictions, including municipalities and the operations and mission of Fort Huachuca. This chapter also presents overviews of land ownership patterns in the study area, and briefly describes the area's current development trends and growth potential.

2.1 LOCAL JURISDICTIONS

2.1.1 Cochise County

Most of the study area is located within Cochise County jurisdiction. Figure 2-2 depicts the municipal jurisdictional boundaries within Cochise County. Cochise County is approximately 6,219 square miles, larger than the States of Rhode Island and Connecticut combined, and with a population of over 135,004 residents.¹ Livestock production, farming and mining uses have a long history in the County, and agriculture remains the dominant land use. Cochise County is predominantly characterized by rural residential communities and concentrated small urban centers, largely surrounded by farming and livestock uses. Fort Huachuca is located in the southwestern portion of Cochise County, and has historically been and continues to be a significant part of the Cochise County history, and is the largest single employer in the County. Major industries within Cochise County include services, retail trade and construction. Property ownership in Cochise County is broken down by approximately: 40 percent individual and corporate, 35 percent Arizona State Land, 22 percent USFS and BLM, and four percent other public land.²

Cochise County is comprised of a great diversity of topography, climate, and ecological systems that provide for a variety of habitats and wildlife. Much of the Coronado National Forest is located in Cochise County, including several "sky island" isolated mountain ranges

¹ Arizona Department of Economic Security, 2006. Cochise County Population Projections 2006-2055 .

² ADOC, 2004. Profile: Cochise County, Arizona. Arizona Dept. of Commerce. September

that rise out of arid desert climates. The City of Sierra Vista is the largest city within the County. Other incorporated cities within Cochise County include Huachuca City and the Cities of Bisbee, Douglas, Willcox, Benson, and Tombstone. Only Huachuca City and the Cities of Sierra Vista and Tombstone are fully located within the study area, along with a portion of the City of Benson.

Land use and development within the unincorporated areas of the County is guided by the Cochise County Comprehensive Plan and Zoning and Subdivision ordinances. All of the unincorporated areas of Cochise County have been zoned. The purpose of zoning is to guide the development of land in accordance with the County's Comprehensive Plan. The Cochise County Comprehensive Plan, adopted in 1984, revised in 1996, and amended in 2002 and 2003, serves to promote orderly and well-planned County growth. The Plan consists of a written document establishing land use, transportation, water conservation and public facility goals and polices and a series of maps that serve as a blueprint for the intensity and type of land uses expected near the incorporated cities and towns and in the outlying rural areas. The Cochise County Comprehensive Plan addresses land use and related planning issues within or adjacent to the County boundaries. This plan, like other county comprehensive plans and city general plans throughout Arizona, are regulated by various State laws, including the Growing Smarter and Growing Smarter Plus legislation and by ARS §28-8481, among others. The major issues driving the plans are future population growth and development, and the various land uses and geographic areas that are proposed to enable that growth.

Community and area plans are amendments to the Cochise County Comprehensive Plan that address the future growth of a specific community or region of the County. Six community plans have been adopted in Cochise County: the Naco Community plan and Development Map, the Mid-Sulphur Springs Valley Area Plan (for an area surrounding Sunsites and Pearce), the Southern San Pedro Valley Area Plan (for an area south of Hereford Road), St. David Area Plan (southeast of Benson), the Tres Alamos Area Plan (north of Benson) and the Babocomari Area Plan which includes a portion of the original San Ignacio del Babocomari Land Grant, east of State Highway 90 and north of Huachuca City. These plans are based on long discussions with the community and are designed to support land uses that enhance and protect an area's unique character. Criteria and policies for approval of special uses and requests to change existing zoning within planned areas have been developed to help preserve the character and intent of each plan designation.



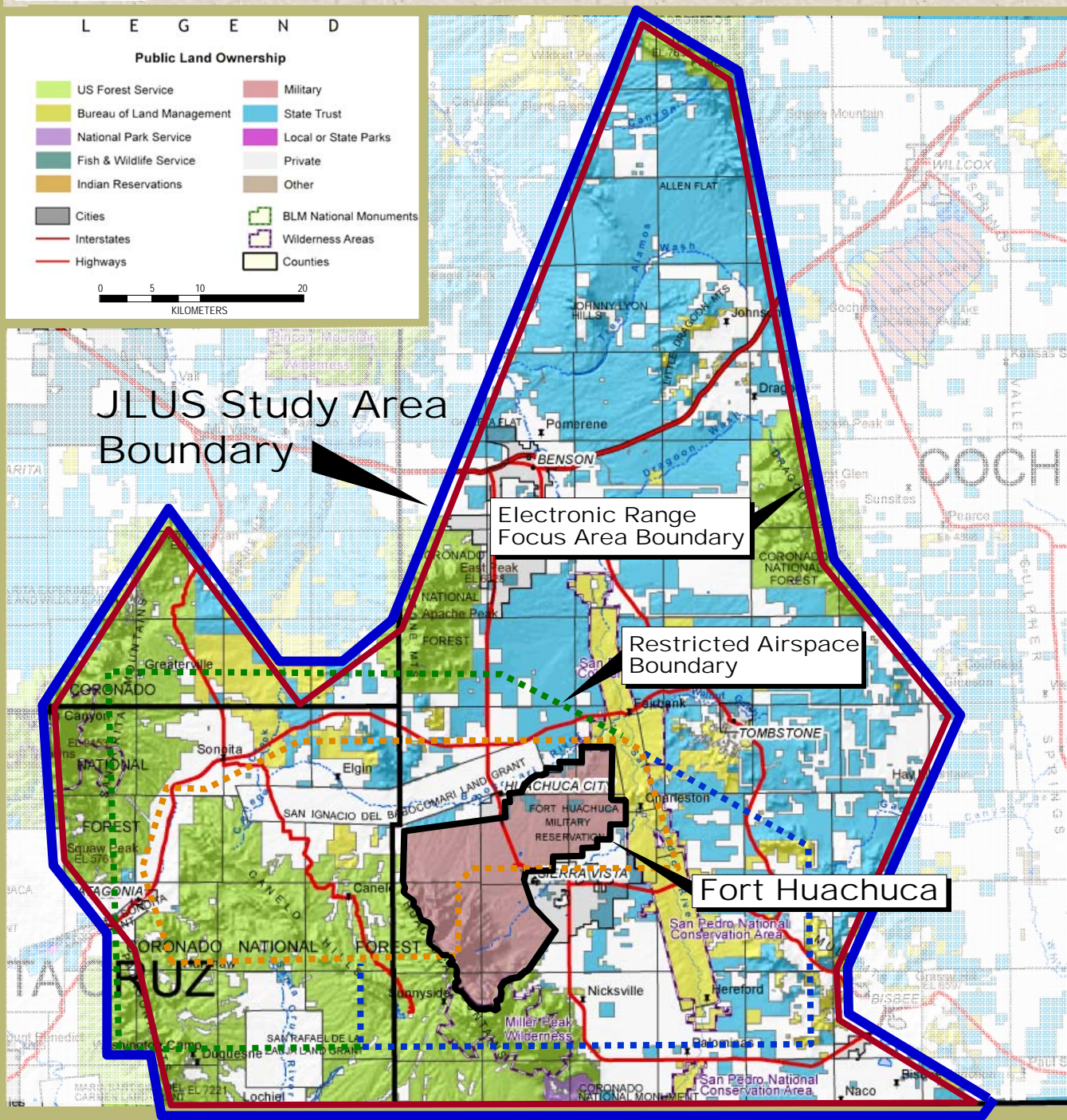
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LEGEND

Public Land Ownership

- | | |
|---|---|
| US Forest Service | Military |
| Bureau of Land Management | State Trust |
| National Park Service | Local or State Parks |
| Fish & Wildlife Service | Private |
| Indian Reservations | Other |
| Cities | BLM National Monuments |
| Interstates | Wilderness Areas |
| Highways | Counties |



Source: Adopted from Arizona State Land Department, Arizona Surface Management Responsibility Map

Figure 2-1: Fort Huachuca JLUS Study Area



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Comprehensive Plan Growth Areas and Land Jurisdiction Cochise County, Arizona

This is not a survey product. The information is derived from the Cochise County GIS Databases. The county does not assume any liability for damages arising from errors, omissions, or use of this information. Users of this map are advised to be aware of the locational accuracy, data collection dates, compilation methods, and cartographic format. Users are advised to use this map appropriately.

LEGEND

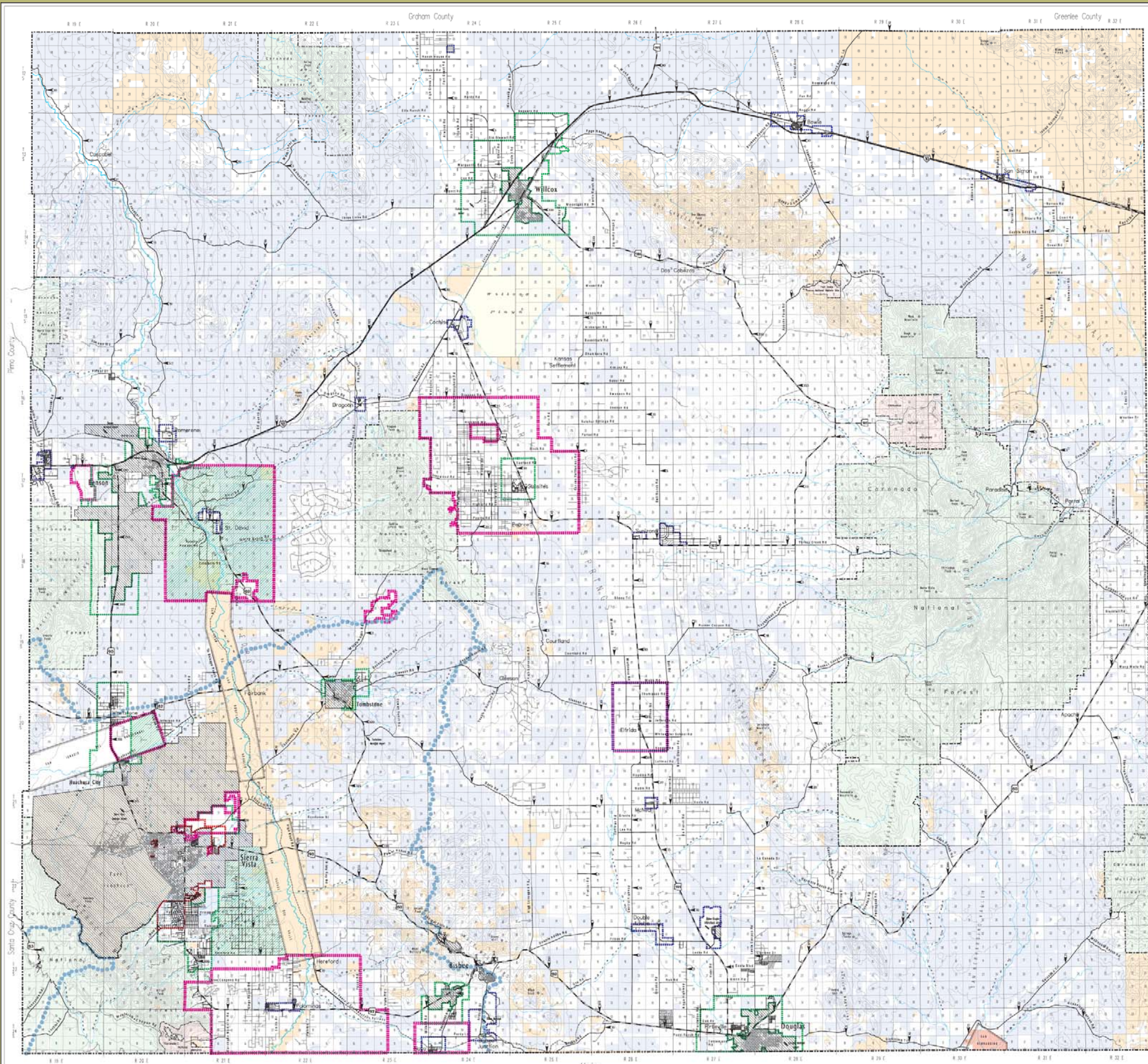
- | | | |
|---------------------------------|--|---|
| Private | Bureau of Land Management (BLM) | Willcox Bombing Range |
| State Trust | National Forest | San Bernardino Wildlife Refuge |
| Category A Growth Area Boundary | National Park | Incorporated City |
| Category B Growth Area Boundary | Military Reservation | Sierra Vista Subwatershed Boundary |
| Category C Growth Area Boundary | County Maintained Road | National Forest Administrative Boundary |
| Area Plan/MDP Boundary | Neighborhood Road, City Street and Unimproved Road | National Park Boundary |
| Category D (Rural Residential)* | County Boundary | Land Grant Boundary |
| | Railroad | |

0 2.5 5 7.5 Miles

Information Technologies Department
19 Apr 06



**FIGURE 2-2:
COCHISE COUNTY JURISDICTIONAL
AND GROWTH BOUNDARIES**



The entire area of Cochise County, with the exception of incorporated cities, is divided into the following four categories, based on each area's existing or foreseeable infrastructure, character and capacity for growth, as shown in Figure 2-2:³

- Category A -Urban Growth Areas - This category includes those areas adjacent to or surrounded by incorporated cities, and having the necessary facilities and services to support it. These areas are largely built out or established but may have pockets of vacant land.

A substantial area of Category A designated lands are located adjacent to Fort Huachuca, along a southwestern portion of the Fort border. Additional Category A designated lands are located west of Fort Huachuca and north and south of the City of Sierra Vista, as shown in Figure 2-2.

- Category B Community Growth Areas - This category includes those areas adjacent to Category A Urban Growth Areas as well as the larger unincorporated communities of the County, which are experiencing growth. These are areas in transition from a traditional rural environment to something more urbanized.

An area of Category B designated land is located near the southwestern Fort boundary, south of the City of Sierra Vista. Another large strip of Category B designated land is located near Fort Huachuca's East Range, and lies within the Babocomari Area Plan, where subdivisions on 1 acre parcels are planned, and continues north through the unincorporated community of Whetstone, east and west of State Route 90. The City of Benson has a large swath of Category B surrounding the city limits in anticipation of the growth that this area is already experiencing within the city limits. In the 1990's, the City of Benson approved 20,000 to 25,000 residences to be built within its city limits along State Route 90, that are now beginning to be developed through master plans and subdivisions. Other Category B designated areas are located near the City of Bisbee, City of Tombstone, Douglas, and the unincorporated community of Sunsites, as shown in Figure 2-2. Additionally, a large area of Category B designated land is located around the City of Willcox, which is located north of the Willcox Playa. Willcox Playa, as discussed in Section 3, is an area leased by Fort Huachuca to support receiving/transmitting facilities.

- Category C -Rural Community Areas – This category includes less populated rural communities that are characterized by a slow rate of growth and the desire to maintain the existing neighborhood or rural atmosphere. These areas are generally found as small clusters of residential and non-residential development adjacent to agricultural production areas. Non-residential enterprises generally serve or coincide with local agricultural, ranching or tourist activities. Category C areas are often populated enough to warrant or provide a K-8 grade school. Their rural, low density and often scenic qualities have the potential to attract future residents at a growth rate that may warrant consideration of a plan change to Category B. As shown in Figure 2-2, relatively small clusters of Category C designated land are located throughout the study area, in and around the St. David and Palominas communities, and north of the City of Tombstone. Additionally, a cluster of Category C designated

³ Cochise County, 1996. County of Cochise Comprehensive Plan. Adopted 1994 and last amended 2006. Page 18.

land is located in and around the unincorporated community of Cochise, which is located near the Willcox Playa.

- Category D Rural Areas - This category includes the outlying rural areas between cities and unincorporated communities, and areas characterized by a low growth rate; unimproved roads; low density, large lot rural residential development; agricultural production; and large tracts of undeveloped private and public lands. Non-residential development is geared toward providing local services, tourism or intensive uses that are not appropriate in more the densely populated parts of the County, such as power plants and feedlots. These sparsely populated rural lands also have the potential for future master-planned communities that will provide the infrastructure to support any proposed increases in residential density or non-residential activities. For example, the highest density new development planned in the County at this time is in the Sunsites area, a retirement community that was initially developed in the 1960's with a golf course and small lots. New developers are proposing to add an additional 1,700 new homes to this area as well as improve the outdated and aging infrastructure of the existing village, including the addition of a new wastewater treatment plant, water distribution system and drainage/flood control structures. Another example, the Whetstone community, is located partially within Category D land, and partially within Category B land. This unincorporated community is proposing its own Area Plan to guide future growth and includes 110 square miles and straddles Highway 90 from the southern portion of the City of Benson south to Fort Huachuca.

Over 90% of Cochise County is designated Category D. Category D designated lands within the study area are located around and between the Category A, B and C growth areas surrounding unincorporated and incorporated communities.

The population of Cochise County is growing and is expected to reach 162,667 persons in year 2015.⁴ Cochise County's 2005 Estimates of Population and Growth derived from the Arizona Department of Economic Security data shows a rate of approximately 2.8% annual growth in the Sierra Vista area, including incorporated and unincorporated growth. Major trends include new planned subdivisions developing in formerly rural areas outside the major urban growth areas. Increasing demand for second homes, retirement communities and an “exurban” or “small-town” lifestyle has resulted in increased population growth and housing in areas that were formerly rural in character. This development may occur in new planned subdivisions as well as through construction of new residences on individual parcels. Development of residential uses on individual lots in unincorporated areas of Cochise County is largely occurring through lot splitting rather than subdivisions (developments of 6 or more lots). Cochise County has limited authority to review and approve lot splits (ranch surveys of 36-acre or greater parcels, or smaller properties split into 5 or less lots) in unincorporated areas, and thus “wildcat development” is another major development trend within the County. The process of engineering, reviewing, approving and developing a subdivision plat takes time and money. Many developers or landowners generally find lot splitting to be more expedient. However, future residential

⁴ Arizona Department of Economic Security and Cochise College Center for Economic Research using U.S. Census data for 1990 and 2000, and Arizona Department of Economic Security mid-year population estimates for 2001 through 2005. Last Updated March, 2006.

development is increasingly being proposed through the County's subdivision process, because of recent changes to the County's subdivision regulations affording incentives to go through the subdivision process for more lots rather than splitting. Subdivisions are required to address important issues like drainage, road improvements, water, and wastewater treatment before any lots are approved for sale.

Another relevant, recent trend is an increased number of permit applications for private airstrips associated with proposed subdivisions within the County. Most of these, however, require public hearings and special approval by the County. These are evaluated by the County in light of community support or opposition as well as potential impacts to military airspace activities in the area.

2.1.2 City of Sierra Vista

The City of Sierra Vista is the largest city within Cochise County, and is the major population center for southeastern Arizona, and within the study area. The City of Sierra Vista serves as a main commercial and recreational hub in the region, with an economy inextricably linked to Fort Huachuca. In fact, the history of Sierra Vista began with establishment of Camp Huachuca in 1877. Over the years, the military outpost became a Fort, and later an infantry training base during World War II. In 1956, the City of Sierra Vista incorporated, and it has grown to encompass 139 square miles (including Fort Huachuca's 119 square miles) and a population of over 40,415 residents.⁵

In 2002, as part of a comprehensive planning effort the City of Sierra Vista and Cochise County signed a Joint Planning Agreement that allows for the establishment of a development plan that covers areas extending 20 miles beyond the City's limits, which is reflected in the City of Sierra Vista Vista 2020 General Plan. The Vista 2020 General Plan serves as the primary framework for future development within the City. The Vista 2020 General Plan Land Use Maps are provided as Attachment 1 to this document.

The City of Sierra Vista is urban in character, and is near complete build-out. The backbone of the City's approach to managing high growth is Goal 5-1 of the Vista 2020 General Plan Growth Element: "Target Growth to identified growth areas." The City has identified four areas where growth will likely occur:⁶

A. State Trust Land, Section 2

Section 2 includes 240 acres of undeveloped State Trust Land. The City has already invested in infrastructure in this section, and the plan for this area includes a mix of land use and multiple zoning designations.

B. State Trust Land, Section 36

C. Section 36 includes 320 acres of mostly undeveloped State Trust Land. The City has already invested in infrastructure in this section, and the plan for this area includes a mix of land use and multiple zoning designations. This identified growth area,

⁵ ADOC, 2004. Profile: Cochise County, Arizona. Arizona Department of Commerce. September.

⁶ City of Sierra Vista, 2002. City of Sierra Vista Vista 2020 General Plan. Adopted December. Page 34; and Arizona Department of Economic Security and Cochise College Center for Economic Research using U.S. Census data for 1990 and 2000, and Arizona Department of Economic Security mid-year population estimates for 2001 through 2005. Last Updated March, 2006.

along with State Trust Land, Section 2 could help reduce sprawl due to their locations.

D. Land current owned by Castle & Cooke Arizona, Inc.

The adopted land use plan for this area designates a mixture of residential, open space, commercial, and industrial uses.

E. Land current owned by Bella Vista Ranches

The adopted land use plan for this area designates a mixture of residential, open space, commercial, and industrial uses.

The City has worked with the top three landowners with the largest acreage of vacant land within the City (Castle & Cooke Arizona, Inc., Bella Vista Ranches, and the Arizona State Land Department), to develop land use plans that are consistent with the City's General Plan.

2.1.3 Huachuca City

Huachuca City is located within the study area, and borders Fort Huachuca to the north and east. Huachuca City is located in southeast Cochise County, with a population of approximately 1,830 persons that is anticipated to substantially increase by over 10 percent by 2008, due to multiple planned subdivision projects.⁷ A 2,200 unit subdivision, called Campstone, which borders the northern Fort boundary is in early planning stages. Additionally, multiple smaller scale subdivisions within the City are in the planning stages.

The City is noted for its historical, recreational and scenic features. Huachuca City's economy is closely tied to Fort Huachuca. Fort Huachuca, Tombstone Unified School District and the City are the major public employers, while Foxworth-Galbraith Lumber, Circle K and Coca-Cola Distributing Center are the major private employers. The Huachuca City Land Use Map is provided as Attachment 2 to this document.

2.1.4 City of Benson

Most of the City of Benson is located within the study area, along the northern study area boundary. The City of Benson, with a population of approximately 4,740 persons, is situated in the northern portion of Cochise County.⁸ The City supports a large retired population and is a winter vacation home destination. It's nearby historic and scenic sites, including the Kartchner Caverns State Park, are popular tourist destinations. Benson's economy is largely based on the role it plays as a regional transportation hub, and the City plans to develop an airport-industrial complex which includes an expanded airport and surrounding industrial uses.

The City of Benson has the greatest growth potential of any area within the County,⁹ and is one of the most rapidly growing areas of the State.¹⁰ Multiple master planned

⁷ Armstrong, 2007. Personal communication between Ron Armstrong, Huachuca City Town Administrator/Clerk, and Brynna McNulty, Senior Planner with Parsons. April 5.

⁸ ADOC, 2007. Community Profile: City of Benson, Arizona. Arizona Department of Commerce. 2007

⁹ Apel. 2007. Personal communication between Mark Apel, Planning Manager of Cochise County, and Brynna McNulty, Senior Planner with Parsons. April 5.

communities, including Whetstone Ranch and Sands Ranch) in addition to subdivisions are driving forces behind the growth. The City of Benson General Development Plan plans for a traditional “small town” urban form, with a central commercial corridor flanked by residential neighborhoods to the north and south. New residential development within the City is emerging to the south of the original neighborhoods from Huachuca and San Pedro Streets. Other growth areas include master planned developments in the southern portion of the City, and commercial development along State Highway 90 and I-10. The Arizona Department of Transportation (ADOT) is planning for the reconstruction of the State Route 90 and I-10 interchange in the City of Benson as well as the re-alignment of the interstate just west of the interchange, scheduled to begin in 2008. Overall, the reconstruction may facilitate additional growth in an already expanding area in and around Benson. The City’s population is expected to reach 5,752 by year 2015.¹¹ The City of Benson Future Land Use Map and Growth Areas Map from the City’s 2002 General Development Plan are provided as Attachment 3 to this document.

2.1.5 City of Tombstone

The City of Tombstone is located within the study area, northeast of Fort Huachuca. The City of Tombstone is a major tourist attraction for its history as an early mining town. The City itself is designated a National Historic Landmark. For this, historic resource and tourism concerns largely shape land use planning in the City of Tombstone.¹² Tourism is the mainstay of its economy. The City has a population of approximately 1,610 persons.¹³ The City of Tombstone, Tombstone Public Library and Unified High School District are the major public employers, while Best Western Lookout Lodge, Helldorado Town, Inc. and Holiday Inn Express are the major private employers. New development within the City is primarily in the form of infill within existing development patterns, with a focus on commercial development along Highway 80.¹⁴ The City is considering plans to annex three adjoining areas to the east, west and south, on which higher density residential development is beginning to occur on existing ranch and mining properties.¹⁵ These developments, along with most new residential development within the City, is catering to a growing retirement community in Tombstone. The City’s population is expected to reach 1,827 persons by year 2015.¹⁶

¹⁰ City of Benson and San Pedro Valley Chamber of Commerce. <http://www.bensonchamberaz.com/>
Accessed January 10, 2007.

¹¹ Arizona Department of Economic Security and Cochise College Center for Economic Research using U.S. Census data for 1990 and 2000, and Arizona Department of Economic Security mid-year population estimates for 2001 through 2005. Last Updated March, 2006.

¹² City of Tombstone. 1998. City of Tombstone Planning Guide for the Comprehensive Plan. February 5. Page 2.

¹³ ADOC, 2007. Community Profile: City of Tombstone, Arizona. Arizona Department of Commerce. 2007

¹⁴ No land use or zoning map for the City of Tombstone is provided as an attachment to this document, due to the lack of an updated and relevant City zoning or land use map.

¹⁵ Schmidt, 2007. Personal communication between Stephan Schmidt, Tombstone Councilman Ward No.2, and Brynna McNulty, Senior Planner with Parsons. March 29.

¹⁶ Arizona Department of Economic Security and Cochise College Center for Economic Research using U.S. Census data for 1990 and 2000, and Arizona Department of Economic Security mid-year population estimates for 2001 through 2005. Last Updated March, 2006.

2.1.6 Santa Cruz County

Most of the portion of the study area west of Fort Huachuca is located within Santa Cruz County. Santa Cruz County is the smallest county in Arizona, with an area of approximately 1,238 square miles. As of year 2000, its population was 38,381.¹⁷ The City of Nogales, the County seat, is a major point of entry along the U.S./Mexico border. Santa Cruz County is made up of diverse communities that are recognized for natural and scenic beauty, and historic landmarks. Tourism and cross-border commerce are large components of the County's economy and culture. Increasingly the largest employer in Santa Cruz County is the federal government through the growth and reorganization of the Department of Homeland Security. Other major employers include the Nogales Unified School District (1,341), Santa Cruz County (412), ICT Call Center (300-400), Santa Cruz Unified School District 35 (370) and the City of Nogales (304). While the City of Nogales and the Town of Patagonia have maintained fairly level population figures over the past decade, the unincorporated area, particularly in Rio Rico and Tubac along the I-19 corridor, have grown considerably. Rio Rico's 2000 census figures were about 11,000 residents; the population now is estimated to be near or at 20,000 persons anticipated to exceed the population of Nogales.

Overall, development in Santa Cruz County has historically been located along the Santa Cruz River north of Nogales, and later along Interstate 19 (I-19). Plans for major development at and around the "Sonita Crossroads," the location where State Highways 82 and 83 intersect, are in early stages.¹⁸ Growth trends are closely linked to the increasing cross-border trade and tourism, although retirees and second-home buyers are also a factor in housing starts. The population of Santa Cruz County is expected to reach 60,000 persons in year 2020.¹⁹ Most of the growth in Santa Cruz County is in the residential sector. Although affected by the recent decline in activity, between 2002 and 2004, the number of residential building permits was consistently increasing by 200 each year. Recent proposals for new development indicate that over the next decade new development will continue to predominantly locate along the I-19 corridor, and in the area of the City of Nogales, which is just southwest of the study area.²⁰ New residential development within the County is beginning to shift from individual homes constructed on private lots to production housing, a trend occurring throughout southern Arizona. According to the Santa Cruz County Comprehensive Plan Land Use Element, between 1999 and 2004 approximately 30 percent of requests for residential rezoning were for parcels larger than 100 acres. Of these, over 40 percent are at densities exceeding four residences per acre. Less than 40 percent of land in Santa Cruz County is privately owned. The Santa Cruz County Comprehensive Plan explains that this has the dual effect of ensuring that the majority of the County will remain as open space, while limiting the options where growth can occur. The Santa Cruz County Comprehensive Plan Land Use Map is provided as Attachment 4 to this document.

¹⁷ Wikipedia, 2007. http://en.wikipedia.org/wiki/Santa_Cruz_County,_Arizona. Accessed January 25, 2007.

¹⁸ Dohl, 2007. Personal communication between Mary Dahl, Community Development Director with Santa Cruz County, and Brynna McNulty, Senior Planner with Parsons. February 1.

¹⁹ Ibid.

²⁰ Santa Cruz County, 2004. Santa Cruz County Comprehensive Plan. Adopted June 29. Page 31.

The San Rafael Valley of Santa Cruz County encompasses most of the land within the County that is located within the study area. The 172 square mile San Rafael Valley, headwaters of the Santa Cruz River, is located in southeastern Santa Cruz County. The Santa Cruz River is unique in that it flows south from its origin into Mexico and then turns back north and flows back into the U.S. east of Nogales. The San Rafael Valley has traditionally been used for ranching and farming, dating back to the 1800s. It contains one of few remaining short prairie grass eco-systems in the southern United States, and for this, three major conservation easements totaling 19,000 acres are in place to preserve an integral part of the valley. A major portion of the San Rafael Valley is part of the Coronado National Forest. The San Rafael Valley and most of southeast Santa Cruz County has experienced extremely low growth rates, consistent with the available infrastructure and services and ranching character of this area. ²¹

2.2 LAND OWNERSHIP

Major land ownership in the study area can be divided into four principal classifications: federal, state, municipal, and private. Land ownership in the study area is shown in Figure 2-1 and is briefly described below. Additionally, Table 2-1 provides a breakdown of property ownership within the study area, and Table 2-2 provides a breakdown of uses of leased State Trust Land within the study area.

Table 2-1 PROPERTY OWNERSHIP WITHIN THE STUDY AREA		
Property Owner	Acres	Percent
BLM	136,460	8.28%
Coronado National Forest Service	402,179	24.40%
Coronado National Park Service	4,018	0.24%
Military – Fort Huachuca	79,684	4.83%
State Trust	501,002	30.40%
State Parks Department	723	0.04%
Private	523,916	31.8%
Other	182	0.01%
Total Area	1,648,165	---

Source: Arizona State Lands Department, 2007.

²¹ Santa Cruz County, 2004. Santa Cruz County Comprehensive Plan. Adopted June 29. Page 23.

Table 2-2 STATE TRUST LEASED LAND USE WITHIN THE STUDY AREA		
Trust Land Leased Use	Acres	Percent
Agricultural	297	0.06%
Commercial	992	0.12%
Grazing	487,490	97.38%
Unleased	12,161	2.43%
US Govt Exclusive Use	62	0.01%
Total Area	501,002	---

Source: Arizona State Lands Department, 2007.

2.2.1 Federal Lands

- Outside the boundaries of Fort Huachuca, there are extensive federal land holdings in the study area. Major federal land holdings in the study area include those of:
- **Military:** As discussed in detail in Section 3 of this document, Fort Huachuca comprises land within the study area owned by the U.S. Army. Additionally, the U.S. Army leases land in the Willcox Playa and Sunnyside to support operations critical to the Fort’s mission.
- **U.S. Forest Service (USFS):** Much of the western and southern portion of the study area is comprised of USFS land, part of the Coronado National Forest, “sky island” mountain range. The USFS manages approximately 1,780,000 acres of land throughout southeastern Arizona and southwestern New Mexico that comprise the Coronado National Forest. Twelve widely scattered mountain ranges or "sky islands" that range in elevation from 3000 feet to 10,720 feet make up the Coronado National Forest. This forest supports a markedly diverse range of plant communities and wildlife species.
- The Coronado National Forest is made up of five administrative units called Ranger Districts. Each District includes a number of mountain ranges, each with its own unique character. The Sierra Vista District incorporates several mountain ranges which are separated by rolling hill country and some of the Southwest’s most extensive grasslands. Within its boundaries lie the Huachuca, Patagonia and Whetstone Mountains and the Canelo Hills. These areas were once the focus of extensive mining activity, and their canyons and ridges are rich in the history of those colorful days. These are also the mountains that surround the San Pedro River Valley, referred to locally as “the bowl.” The Sierra Vista District of the Coronado National Forest borders almost the entire western and southern boundaries of Fort Huachuca, and comprises nearly the entire western and southern portions of the study area. As discussed in Section 3, Fort Huachuca leases property in the Sunnyside area of the Coronado National Forest for electronic testing

operations. In summary, USFS land comprises approximately 210,673 acres and 23 percent of land ownership within the project study area.

- National Park Service (NPS): The NPS cares for a network of parks across the country, with the mission to conserve and extend to the public the benefits of natural and cultural resource conservation and outdoor recreation. Approximately 4,750 acres of NPS land is located within the southernmost portion of the study area, otherwise known as the Coronado National Memorial. The Coronado National Memorial commemorates and interprets the significance of Francisco Vásquez de Coronado's expedition and the resulting cultural influences of 16th century Spanish colonial exploration in the Americas. The location offers panoramic views of the U.S.-Mexico border and the San Pedro River Valley, the route believed to have been taken by Coronado. The Coronado National Memorial offers many recreational activities including hiking, picnicking, spelunking and bird watching. The Coronado National Memorial is the only NPS land located within the study area, comprising approximately 4,018 acres and 0.4 percent of land ownership in the study area.
- Bureau of Land Management (BLM): The BLM carries out a variety of programs to manage and conserve federal land and resources, including energy and minerals; timber; forage; recreation; wild horse and burro herds; fish and wildlife habitat; wilderness areas; and archaeological, paleontological, and historical sites. In addition to its aforementioned substantial minerals management program, the BLM administers mineral leasing and oversees mineral operations on Federal mineral estate underlying other state, private, or federally administered land, and manages most mineral operations on Indian lands. BLM land provides significant economic benefits to the nation and to states and counties where these lands are located. Revenues generated from public lands make BLM one of the top revenue-generating agencies in the federal government. The job of balancing this mix of resources and uses grows more complex each year, as population growth creates new pressures and heightens existing management challenges. This growth and the urbanization that accompanies it places new demands on BLM-managed land.
- The study area includes the BLM-managed San Pedro riparian area, containing about 40 miles of the upper San Pedro River, which was designated by Congress as a National Conservation Area (NCA) on November 18, 1988. The primary purpose for the designation is to protect and enhance the desert riparian ecosystem, a rare remnant of what was once an extensive network of similar riparian systems throughout the Southwest. Managed by the BLM Tucson Field Office, the San Pedro Riparian NCA contains over 58,000 acres of public land in Cochise County, between the US/Mexico border and the town of St. David, Arizona. The San Pedro Riparian NCA is located adjacent to most of the northeast boundary of Fort Huachuca, and the entire NCA is located within the study area. A large area of BLM land is located in the northwestern portion of the study area, and a small cluster of BLM land is located near the northwestern boundary of Fort Huachuca. Additionally, there are substantial expanses of BLM land in the western, eastern and southeastern portions of the study area. Clusters of BLM land are also located near the northwestern boundary of Fort Huachuca, and some additional BLM land is located in the northern portion of the study area. BLM land comprises approximately 136,460 acres and 8 percent of land ownership within the project study area.

- The aforementioned federal agencies which have jurisdiction within the study area, do not have aggressive land sales programs, and instead issue leases, rights-of-way, and use permits for a wide variety of uses through land management programs.

2.2.2 State Lands

- Outside the boundaries of Fort Huachuca, there are extensive State land holdings in the study area. In total, State lands comprise approximately 501,002 acres and 30 percent of land ownership within the project study area. Major State land holdings in the study area include those of the:
- Arizona State Land Department: State property ownership within the study area includes that of the Arizona State Land Department, or State Trust. The Arizona State Land Department manages Arizona's State Trust Lands. At statehood, the federal government granted Arizona 10 million acres of land, known as State Trust Land. Income from the sale or lease of this land benefits a variety of public institutions, with the largest portion benefiting the public school system. The use of all State Trust Land must benefit the Trust, a fact that distinguishes it from the way other public lands may be used and disposed. The State Land Department program has changed with the changing economy and growth patterns throughout the state. During the first 65 years of statehood, the state economy was based on natural resources, and the State Trust Land was primarily leased as rural land for livestock grazing, agriculture, and mineral production. During this time, the State Land Department focused on management of the land for its "highest and best use," and land was generally not outright sold, as other states had done at the time. However, the focus of the State Land Department's program has shifted in recent years to reflect the expansion of urban growth throughout the state, from management of rural land to urban and commercial land development. Enabled by several major reform initiatives over the last 20 years, the State Land Department has developed aggressive sales and leasing programs, focused on urban development.
- State Trust Land comprises approximately 501,002 acres and 30 percent of land ownership within the project study area. Most of the northern portion of the study area is State Trust Land, and State Trust Land dominates the central and western portions of the study area, as shown in Figure 2-1. As shown in Figure 2-1, State Trust Land borders Fort Huachuca in some areas along the northern and eastern Fort boundary. Additionally, some State Trust Land is located within the boundaries of Fort Huachuca. This land is referred to as "in-holdings" because the State Trust has no legal access to this land. The United States Congress passed legislation in October 1999 authorizing the land exchange between BLM and the State of Arizona for these "in-holdings," and they are in the process of being conveyed to BLM in exchange for lands elsewhere in Arizona. Exchanging State Trust land is not allowed under current state law, but may be initiated by the U.S. Congress and carried out, by directive, by the DoD and State Land Department.²²Arizona State Parks (ASP): The ASP own land within the study area,

²² Hogue, 2007. Email communication between Jamie Hogue, Deputy State Land Commissioner with the Arizona State Land Department, and Brynna McNulty, Senior Planner with Parsons. January 18.

spread among the following parks: Kartchner Caverns (underground caves, Discovery Center and campground), Tombstone Courthouse State Historic Park (located in an urban setting including built environment historic resources), and portions of Patagonia Lake State Park (250 acres), and San Rafael Ranch Natural Area (over 200,000 acres in total, with 3,550 owned by ASP), and. The ASP manages these natural and cultural resources for conservation, recreation, and education purposes. ASP land comprises approximately 723 acres and 0.04 percent of land ownership within the project study area.

2.2.3 Local Municipal Jurisdictions

As discussed in detail in Section 2.1 of this document, local jurisdictions within the study area include portions of Cochise and Santa Cruz County, as well as the City of Sierra Vista, Huachuca City, and the Cities of Tombstone and Benson.

2.2.4 Private Lands

Outside the boundaries of Fort Huachuca is extensive private property, comprising approximately 523,916 acres and 32 percent of land ownership within the project study area. Private property borders Fort Huachuca in many areas, as shown in Figure 2-1, primarily in areas to the north and east of the Fort. Additionally, there are large stretches of private property in the northwestern and southwestern portions of the study area. Large expanses of private property also exist near the City of Benson and near the west side of the Dragoon Mountains, part of the Coronado National Forest.

2.3 INSTALLATION OPERATIONS

2.3.1 History of the Installation

Fort Huachuca is a product of the Indian Wars of the 1870s and 1880s. In February 1877, Colonel August B. Kautz, commander of the Department of Arizona, ordered that a camp be established in the Huachuca Mountains. This camp would offer protection to settlers and travel routes in southeastern Arizona while simultaneously blocking the traditional Apache escape routes through the San Pedro and Santa Cruz valleys to sanctuary in Mexico. A temporary camp was established at the post's current location on March 3, 1877, by Captain Samuel Marmaduke Whitside with two companies of the 6th Cavalry. The site was selected because it had fresh running water, an abundance of trees, excellent observation in three directions, and protective high ground for security against Apache tactical methods. Camp Huachuca was redesignated a fort in 1882.

In 1886, General Nelson A. Miles designated Fort Huachuca as his advance headquarters and forward supply base for the Geronimo campaign. Geronimo's surrender in August 1886 practically ended the Apache danger in southern Arizona. The Army closed more than 50 camps and forts in the territory, but Fort Huachuca was retained because of continuing border troubles involving renegade Indians, Mexican bandits, and American outlaws and freebooters.

In 1913, the 10th Cavalry "Buffalo Soldiers" arrived and remained almost 20 years. The 10th Cavalry joined General John J. Pershing in the 1916 expedition into Mexico and, during World War I, it was assigned the mission of guarding the United-States-Mexico border.

By 1933, the 25th Infantry Regiment had replaced the 10th Cavalry as the main combat unit for the fort. The 25th in turn was absorbed by the 93rd Infantry Division during World War II. When the 93rd departed for the Pacific in 1943, the 92nd Infantry Division arrived at the fort for training and subsequent assignment to the European Theater. During the war years, the troop strength reached 30,000 men at the fort, which in the 1930s had been described as suitable for a brigade-sized unit of about 10,000 men.

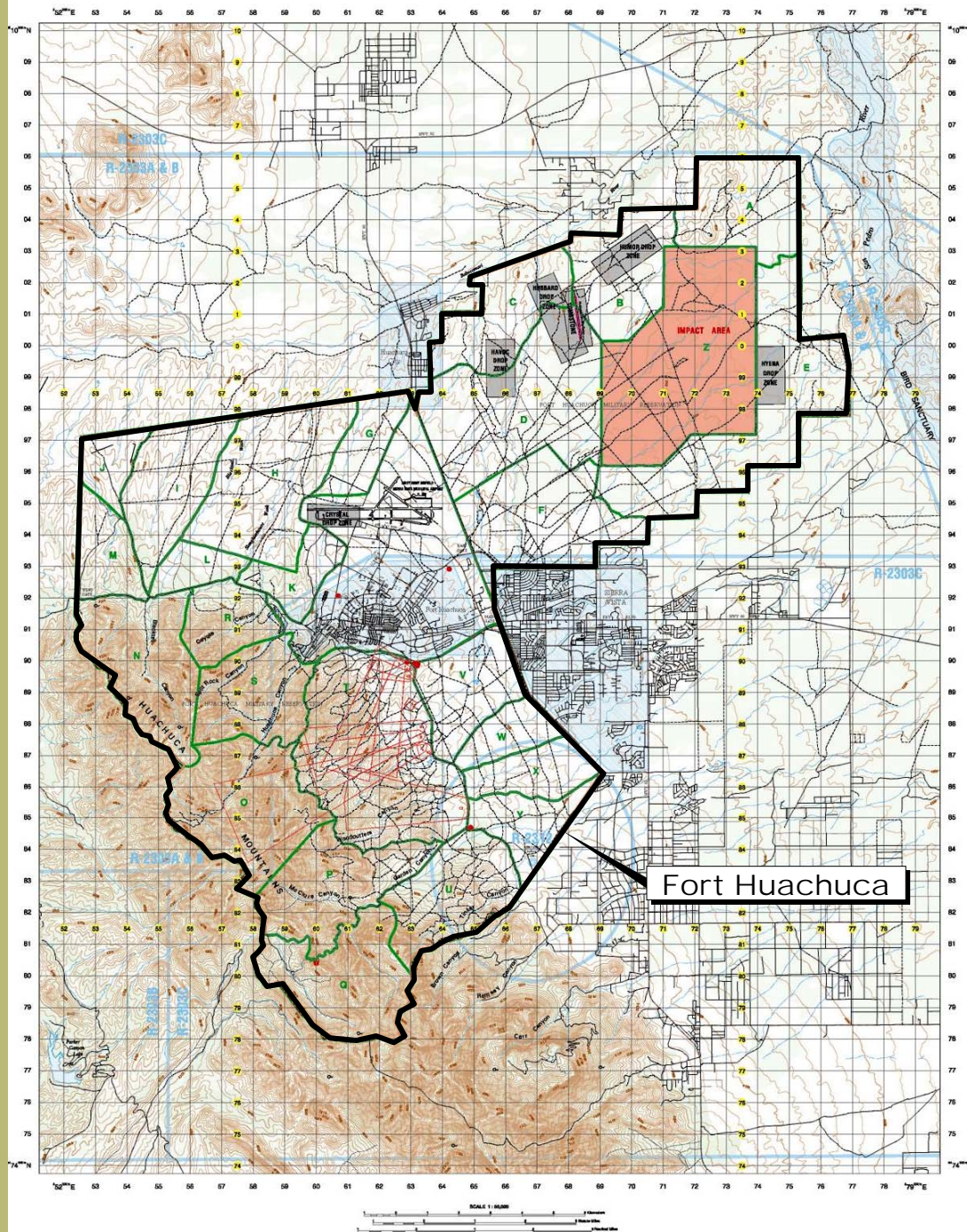
At war's end, the fort was declared surplus and transferred to the State of Arizona. It was reactivated during the Korean War by the Army Engineers. A new era began in 1954 when control passed to the Chief Signal Officer, who found the area and climate ideal for testing electronic and communications equipment. The importance of the fort in the national defense picture grew steadily from that moment. In 1967, Fort Huachuca became the headquarters of the U.S. Army Strategic Communications Command. Then, in 1971, the post became the home of the U.S. Army Intelligence Center and School, bringing with it the School Brigade.



ARIZONA MILITARY REGIONAL COMPATIBILITY PROJECT

FORT HUACHUCA JOINT LAND USE STUDY

FORT HUACHUCA MILITARY INSTALLATION

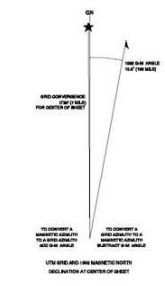


- LEGEND**
- ROADS**
 - Primary all weather, hard surface
 - Secondary all weather, hard surface
 - Light duty all weather, hard or improved surface
 - Flat or dry weather, unimproved surface
 - Trail (dotted)
 - NATURAL FEATURES**
 - Perennial stream
 - Intermittent stream
 - Elevation Contours
 - Forested
 - Wooded/Born
 - MILITARY FEATURES**
 - Military installation
 - Training Facility
 - Training Area
 - Firing Range
 - Impact Area
 - Drop Zone Areas
 - Landing Zone
 - Noise Sensitive Area - Aural Overlay
 - Flight Deck Lines

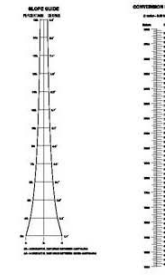
Prepared and Published by the USM US Southwest Regional Support Center
 Center for Geospatial Management of Military Lands
 Colorado State University, Fort Collins, Colorado
 Published October 1999



PROJECTIONS
 UTM Zone 18N
 NAD 83
 UTM Zone 18N
 NAD 83



ELEVATIONS IN FEET
 CONTOUR INTERVAL: 20 FEET
 NOT TO BE USED AS A LAND STATUS MAP



Source: Modified from City of Sierra Vista, AZ

Figure 2-3: Fort Huachuca and Vicinity

The Strategic Communications Command became the U.S. Army Communications Command in 1973, subsequently changing to the U.S. Army Information Systems Command in 1984. In October 1990, the post changed hands with the U.S. Army Training and Doctrine Command becoming the new host command; the U.S. Army Intelligence Center and Fort Huachuca now operates the post.

2.3.2 Units Located at Fort Huachuca

U.S. Army Garrison

The U.S. Army Garrison manages the multitude of functions and services that keep the 73,000-acre installation operating so other organizations on post may concentrate on their primary missions.

As a city unto itself, the Garrison provides support to Fort Huachuca just as any city government supports its community. For instance, the Garrison provides such services as military and civilian personnel, legal, inspector general, logistical, facilities engineering, fire and safety, intelligence and security, housing, public affairs, resource management, internal audit compliance and review, and crime prevention and law enforcement. The Garrison also maintains community facilities and provides necessary services for religious, health, welfare, and entertainment activities. The Garrison is responsible for maintaining Fort Huachuca's quality of life.

As a primary Army installation in Arizona, Fort Huachuca supports the Army Reserve and Army National Guard, as well as its number of other military activities throughout the state.

U.S. Army Intelligence Center

Fort Huachuca is the home of the U.S. Army Intelligence Center (USAIC) which is the originator of the Army's military intelligence structure, the source of all its trained manpower, and the developer of its systems and equipment. The Center is the focal point of the Army's effort to meet its present and future intelligence collection and processing requirements. The U.S. Army Intelligence Center's mission is to lead, train, equip, and support the Army's Military Intelligence professionals. Within the Center, the 304th, 305th, and 309th Military Intelligence (MI) Battalions, which are subordinate units of the 111th Military Intelligence Brigade, conduct technical/tactical Military Intelligence training at Fort Huachuca. In addition, the 344th MI Battalion, headquartered at Goodfellow Air Force Base (AFB) in Texas, is also a subordinate unit of the 111th MI Brigade and has units assigned to Fort Huachuca, Goodfellow AFB, and Pensacola Naval Air Station Florida. Also part of the Center is the Noncommissioned Officer (NCO) Academy, which operates the Noncommissioned Officer Education Course and the Capabilities Development and Integration Headquarters, whose mission is to develop the Army's Military Intelligence vision and be the Army's integrator for intelligence combat systems across the Army.

In addition to the U.S. Army Intelligence Center, there is a synergy between the following unique high-tech Department of Defense organizations that reside on Fort Huachuca.

The United States Army Network Enterprise Technology Command/9th Army Signal Command (NETCOM/9th ASC);

The United States Army Network Enterprise Technology Command/9th Army Signal Command (NETCOM/9th ASC) is the Army's single authority for information management. It provides information services vital to the defense of the United States worldwide, and from its headquarters at Fort Huachuca directs the activities of some 12,000 soldiers and civilians at 104 locations in more than a dozen nations around the world. NETCOM/9th ASC is the major Army command responsible for worldwide information services and Command & Control, Communications, Computers, and Intelligence (C4I), delivering seamless enterprise-level Command, Control, Communications, Computers and Information Technology common-user services and warfighting forces in support of the Army, its service component commanders and combatant commanders. NETCOM/9th ASC:

- Operates, manages and defends the Army's portion of the Global Information Grid
- Shapes, sustains and maintains the Army's communications systems
- Exercises technical control to centralize, standardize and consolidate Army network management
- Monitors, detects, defends against and responds to network attacks

Powerful NETCOM/9th ASC information networks pipe an ever-increasing amount of voice and data messages throughout the world keeping information flowing and allowing soldiers and their leaders to make the split second decisions required on the modern battlefield. Because it is an integrated network operated by one organization and managed from one place by the same organization, it is virtually seamless and very responsive to the needs of the users. NETCOM/9th ASC soldiers and organizations deploy when and where needed to aid warfighters in the successful completion of their missions by providing the required communications seamlessly in the least time possible.

Within NETCOM/9th ASC, the 11th Signal Brigade, headquartered at Fort Huachuca, is the Army's force projection signal brigade. Its mission is providing contingency command, control, and communications and it has the capability to install, operate, and maintain a tactical communications network supporting either joint or Army organizations, establish command center communications nodes, area signal centers, and small extension nodes. It provides installation, construction, and test teams on a worldwide basis during peacetime, war, and operations other than war, and in response to emergency requirements to restore or expand information systems facilities. In addition, the brigade provides on-site training in the operation and maintenance of new or modified non-tactical information systems and limited commercial off-the-shelf communications equipment and systems at worldwide locations.

The U.S. Army Information Systems Engineering Command (ISEC)

The U.S. Army Information Systems Engineering Command (ISEC), also headquartered at Fort Huachuca has the primary mission of system engineering and integration of information systems for the U.S. Army including design, engineering, installing, quality assurance testing, and developing software for the diverse communications and automation systems throughout the Army. The ISEC, as headquarters of a worldwide command, has

field commands, engineering offices, and software development centers located around the continental United States. ISEC engineers and directs the installation of specialized electronic systems throughout the world. These range from the exotic, such as satellite earth terminal installations (for all military services), to the commonplace, such as television and radio broadcasting stations. ISEC plans and executes the test programs associated with all hardware and software systems scheduled for deployment in the Defense Information Systems Agency (DISA), including supercomputers, facsimile, satellite voice and data transmissions and Standard Army Management Information Systems. They perform periodic technical evaluations of systems that are operated and maintained by elements of the Command.

In addition to ISEC Headquarters, Fort Huachuca is the home to Software Development Center-Huachuca. The Software Development Center-Huachuca (SDC-H), one of several software development centers within the ISEC, is the principal Army developer of automated telecommunications software and special communications support systems, and supports approximately 800 Army, Air Force, and Navy telecommunications sites around the world. (Note: 504th reflagged and now part of 11th Sig Bde with new mission).

Additional information about the IESC may be found at: www.hqisec.army.mil/

The Joint Interoperability Test Command (JITC)

The Joint Interoperability Test Command (JITC) is a field command of the Defense Information Systems Agency (DISA). JITC functions as the Department of Defense /DISA operational and technical tester for interoperability, which is the ability for the equipment used by the various services to communicate with each other, as well as other assigned testing tasks. JITC was designated a member of the Department of Defense's Major range and Test Facility Base to provide information systems test and evaluation services to all Department of Defense, other federal agencies, State and local governments, and private industry. The primary mission of JITC is to support the warfighters in their efforts to push/pull information to and from the battlefield in the goal of C4I interoperability. JITC works in-theater to provide operation support for C4I interoperability deficiencies as well as 24-hour, on-demand support to the warfighters for urgent field problems, and is responsible for end-to-end interoperability certification of joint C4I systems. This certification program provides assurance to the war fighters that JITC-certified systems will operate as intended. In addition, JITC provides independent operational evaluation/assessment of C4I systems managed and acquired by DISA. The JITC facilities at Fort Huachuca are located along Brainard Road near Libby Army Airfield. The two main buildings are interconnected with several smaller test nodes via underground cable and form an integrated C4I test complex. In addition to being able to provide on-site testing, JITC can provide testing through a distributed network – an extensive network of military, commercial, and allied test facilities. JITC is made up of military personnel from all four services as well as civilians, and the unique mix of government personnel, supported by contractors, allows JITC the flexibility to meet growing interoperability demands.

Additional information about the JITC may be found at: jtc.fhu.disa.mil/

The Electronic Proving Ground (EPG)

The Electronic Proving Ground (EPG) is the Army's C4I (Command, Control, Communications, Computers, Intelligence) Developmental Tester, and is a test center of the U.S. Army Developmental Test Command, which in turn is part of the U.S. Army Test and Evaluation Command. The mission of EPG is to plan, conduct, and analyze the results of Technical Tests for C4I systems, Signal Intelligence, and Electronic Combat (EC)/Electronic Warfare (EW) equipment. In addition to conducting developmental tests, EPG supports the Army operational test community in the conduct of operational tests, user tests, and experiments, and also supports customers in the joint and training communities. EPG provides quality services to developers through the acquisition development cycle. Early in the acquisition development cycle, EPG, through the use of modeling and simulation can address questions concerning frequency assignment, potential electromagnetic compatibility, and the effects of electronic warfare while the equipment is in the early design stage. Later in the development cycle, extensive measurement capabilities are available to satisfy the developer's data collection needs. EPG conducts bench tests, lab tests, field tests, and tests of large-scale, geographically distributed systems employing a mix of live and simulated instrumentation and assets.

- The Electromagnetic Environmental Test Facility makes extensive use of modeling and simulation for determining electromagnetic effects on test items. It includes the Virtual Battlefield Environment facility, a hardware-in-the-loop simulator that provides scenario-driven communications and radar environments.
- The Instrumented Test Range provides time-space-position information and target signals for open-air testing. An extensive network of precision tracking instrumentation and surveillance radars measure data on airborne and ground-based vehicles. The Instrumented Test Range can collect both airborne and ground telemetry from systems as far west as the Yuma Proving Grounds.
- The Antenna Test Facility provides large scale testing of antennas mounted on platforms, and can determine radiation patterns in the high-frequency to microwave frequencies.
- The Environmental Test Facility can perform a full range of static and dynamic environmental testing on components and systems, particularly electromagnetic compatibility and interference testing, the need for which is becoming more prevalent with the increased number of electronic systems on the battlefield.
- The Electromagnetic Interference/Electromagnetic Compatibility/TEMPEST Test Facility offers testing both at its Fort Huachuca chambers and in the field with portable test equipment.

EPG's area of operation includes more than 9,000 square miles of public and private lands in and around the Fort Huachuca military reservation. Operations are routinely possible on 70,000 acres at Fort Huachuca, 23,000 acres on Wilcox Dry Lake, more than 100,000 acres at Gila Bend, and with prior coordination, on approximately 62 million acres of federal and State owned land.

Additional information about the EPG may be found at: www.epg.army.mil/

The Intelligence and Electronic Warfare Testing Directorate (IEWTD) of the Operational Test Command (OTC);

The Intelligence and Electronic Warfare Testing Directorate (IEWTD) of the Operational Test Command (OTC) is responsible for operational testing of new and unique intelligence and electronic warfare equipment and systems being developed and procured for the Army, offering services from user test concept through execution and the test report on tactical intelligence, reconnaissance and electronic attack systems. The testing at Fort Huachuca takes advantage of the excellent environment for field testing radio frequency-based systems, including manned and unmanned aerial reconnaissance vehicles. The electromagnetic environment, with minimal public restrictions on the frequency spectrum, permits almost unrestricted frequency utilization and jamming. As the operational tester of new and unique intelligence and electronic warfare equipment and systems being developed or procured for use by the Army, IEWTD plays an important part in the material acquisition and fielding process for the Army and Joint Services. In addition, the IEWTD is involved in operationally testing new organizational and doctrinal concepts developed at the Army Intelligence Center at Fort Huachuca. Although most testing conducted by the IEWTD is performed at Fort Huachuca to take advantage of existing range facilities, ideal climatic conditions and the available electromagnetic environment, IEWTD is also frequently called upon to conduct or participate in tests throughout the United States and overseas.

Additional information may be found at: www.otc.army.mil/Otc/Iewtd/IEWTDHome.htm

The U.S. Army Communications-Electronics Command Communications Security Logistics Activity (CSLA)

The U.S. Army Communications-Electronics Command Communications Security Logistics Activity (CSLA) is the Army Wholesale Inventory Manager of Communications Security (COMSEC) Material and is responsible for the acquisition, distribution, and logistics support to all field users of COMSEC equipment, cryptographic key and other software. CSLA is unique in its dual methods of operation. The Army's Standard Logistics System is only used for unclassified COMSEC material, while classified communications security equipment managed as part of the National COMSEC Material Control System. CSLA operates a National Inventory Control Point and National Maintenance Point and is the central Automated Data Processing software system design activity for the Army COMSEC Commodity Logistical, Accounting and Information Management system. Virtually all active Army units, as well as the Arizona Army National Guard and U.S. Army Reserve are CSLA customers.

2.3.3 Operations at Fort Huachuca

With over 72,000 acres of land area, Fort Huachuca has some 67,000 acres available for training with 25 training areas, as well as a Main Post that covers approximately 6,000 acres. However, unlike many installations, operations at Fort Huachuca extend well beyond the boundaries of the Fort. The restricted airspace and the electromagnetic environment surrounding the Fort provide unique advantages for training and testing activities that support the Fort's mission.

Seven “Focus Areas” have been identified to encompass operations at the Fort that extend beyond the boundaries of the Fort, and therefore have potential to affect land use compatibility. These areas are described in the following sections, and are depicted on Figure 2-4.

Electronic Range

The electromagnetic environment that surrounds Fort Huachuca is an unparalleled asset for the testing and training operations carried out under a wide variety of missions. The receiving and transmitting points involved in operations in the “Electronic Range” extend well beyond the boundaries of the Fort; while most points are located within 50 kilometers of the Fort, some operations extend to the Tucson area and beyond (see Figure 2-5).

Fort Huachuca’s Electronic Range Complex is unique in several aspects:

- Much of the land surrounding the Fort is either undeveloped or occupied by low-density uses that generate relatively little electromagnetic activity and therefore relatively little electromagnetic interference.
- Its location in the San Pedro River Valley surrounded by mountains further reduces electromagnetic interference. This area is referred to locally as “the bowl.”
- It is the only U.S. location where aggressive, offensive electronic warfare / jamming can be conducted.
- It is the only test range with a frequency coordination zone protected by federal mandate.
- It is expandable to adjacent Federal, State and Local lands to emulate Division-size tests.
- The Restricted Airspace controlled by Libby AAF is coterminous with much of the Electronic Range providing controlled airspace for UAV testing.



ARIZONA MILITARY REGIONAL COMPATIBILITY PROJECT

Fort Huachuca Joint Land Use Study

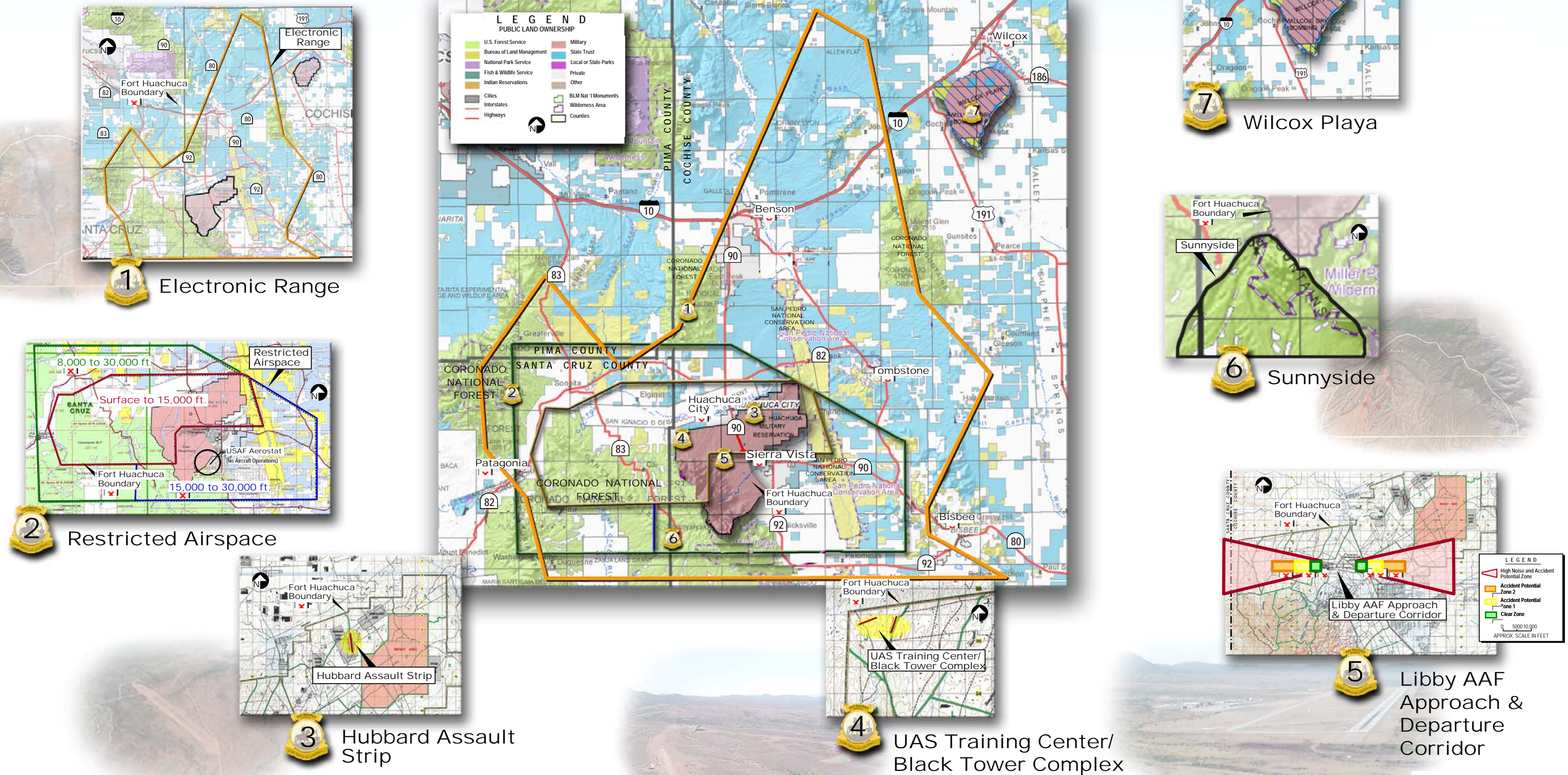
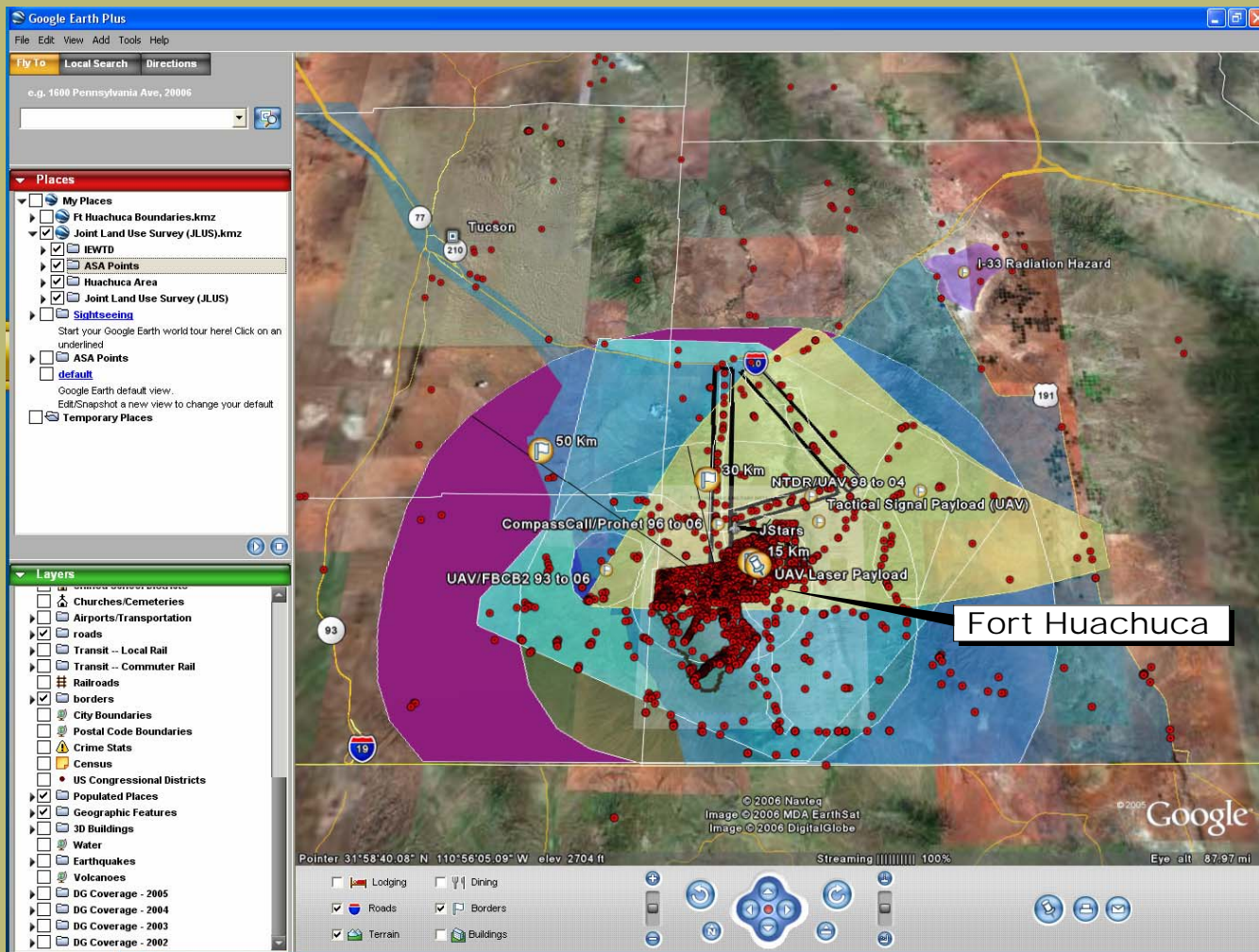


Figure 2-4: Fort Huachuca JLUS Focus Areas Map



ARIZONA MILITARY REGIONAL COMPATIBILITY PROJECT

FORT HUACHUCA JOINT LAND USE STUDY



Source: Fort Huachuca, U.S. Army Intelligence Center, 2006

Figure 2-5: Fort Huachuca Electronic Range Complex

Paragraph 8.3 of the Manual of Regulations and Procedures for Federal Radio Frequency Management published by the National Telecommunications and Information Administration (NTIA) of the U.S. Department of Commerce establishes two areas around Fort Huachuca within which radio frequencies that could affect the U.S. Army Electronic Proving Ground (EPG) are managed.

A “Coordination Zone” is established within which each Federal agency having radio operations in the coordination zone must notify the Area Frequency Coordinator, Fort Huachuca, or the Army IRAC Representative, of the frequency, power, location, and type emission of the radio operations. The coordination zone is defined as an area bounded by connecting lines running along Highway 80 from Tucson to Bisbee, due south from Bisbee to the international border, west along the border to a point due south of Dateland, due north to Dateland, along Highway 80 from Dateland to Gila Bend, and along Highway 84 from Gila Bend to Tucson (excluding traffic on Highways 80 and 84).

- A “Noise Minimize Zone” is established extending 24 kilometers from Fort Huachuca within which transmissions of mobile stations shall be minimized to the extent feasible. Specifically, within the Noise Minimize Zone, signal levels should not exceed the following limits:
 - 10-540 kHz 20 millivolts per meter
 - 540-1600 kHz 50 millivolts per meter
 - 1.6-20 MHz 20 millivolts per meter
 - 20-54 MHz 50 millivolts per meter
 - 54-148 MHz 20 millivolts per meter
 - above 148 MHz 50 microvolts per meter

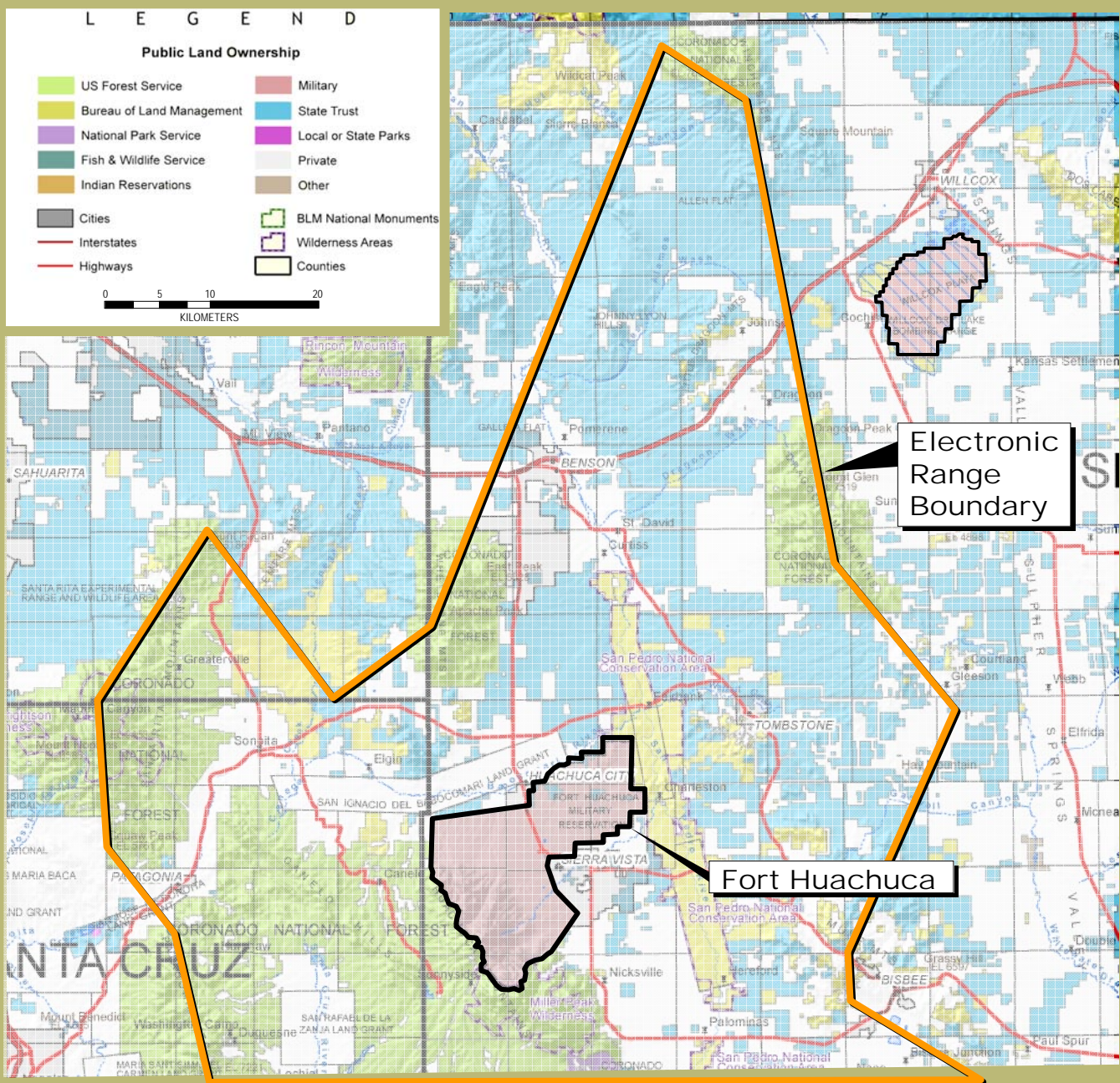
The Manual of Regulations and Procedures for Federal Radio Frequency Management may be accessed at: www.ntia.doc.gov/osmhome/redbook/Manual.pdf

The topography of the San Pedro River Valley forms a natural high altitude "bowl" that largely defines the Focus Area for the Electronic Range, shown in Figure 2-6. The 24 km radius NTIA "Noise Minimize Zone" is located within the boundaries of the Electronic Range Focus Area. Although the actual Electronic Range extends outside the Focus Area boundary and extends as far as Tucson as shown in Figure 2-5, the primary operations most critical to the electronic testing and training missions are carried out within the Electronic Range Focus Area delineated in Figure 2-6. As these missions change and new information about EMI becomes available, the boundary of the Electronic Range Focus Area may require revision. For example, the Fort is conducting research to delineate mountain peaks above a certain elevation on which the development of uses on these peaks that transmit electromagnetic energy (i.e. telecommunications signal facilities) could create EMI interference issues. It is likely that in the future some of these mountain peak areas may be included in the Electronic Range Focus Area.



ARIZONA MILITARY REGIONAL COMPATIBILITY PROJECT

FORT HUACHUCA JOINT LAND USE STUDY



Source: Adopted from Arizona State Land Department, Arizona Surface Management Responsibility Map

Figure 2-6: Electronic Range Focus Area Map

Restricted Airspace

In addition to facilities on the ground, airspace is a vital resource for the missions of Fort Huachuca. The airspace controlled by Libby Army Airfield (AAF) has the capacity to support not only the Fort's missions but also aviation needs of other services. This airspace environment is not duplicated elsewhere in the U.S. and is critical to the missions not only of Fort Huachuca, but also to other military installations in Arizona, including Davis-Monthan Air Force Base and MCAS Yuma, as well as the Arizona Air National Guard, Missouri Air National Guard and other services.

Under the Special Use Airspace (SUA) Program of the Federal Aviation Administration, which designates airspace for military use, various types of airspace were designated, with the objective of segregating military traffic from civilian traffic. The vertical limits of SUA are measured by designated altitude floors and ceilings within which limitations are imposed upon aircraft operations that are not a part of the military operations. Within the category of "Restricted Airspace", the flight of civil aircraft is subject to restrictions due to military operations considered hazardous to other aircraft.

The Restricted Airspace controlled by Libby AAF has three components. These are shown on Figure 2-7:

- Airspace R 2303A – Located to primarily to the north and west of Fort Huachuca's main post, including the East Range, aircraft operations within this area are under the control of Libby AAF from the ground surface to 15,000 ft Mean Sea Level (MSL). This positive airspace control allows for low-level flights of manned and unmanned aircraft at elevations below 3,000 feet above ground level (AGL) and such operations would occur at less than 500 feet above the typical surface elevation.
- Airspace R 2303B – Extending both north and south of Airspace R 2303A, as well as west to the community of Patagonia, aircraft operations within this area are under the control of Libby AAF from 8,000 to 30,000 ft MSL. Effectively this means that operations controlled by Libby AAF occur above approximately 3,000 feet above ground level (as the typical ground elevation in the area is around 5,000 feet above MSL).
- Airspace R 2303C – Extending predominantly south and east from the Fort, and including the Fort's main post as well as the City of Sierra Vista, aircraft operations within this area are under the control of Libby AAF between 15,000 and 30,000 feet MSL. Effectively, this means that operations controlled by Libby AAF occur at altitudes over 10,000 feet above ground level.

Airspace R-2312, which is a circular area located over a portion of the southeastern part of the Fort as well as a portion of unincorporated Cochise County to the south of Sierra Vista is the location of the U.S. Air Force Aerostat, and no aircraft operations are allowed in this area. The Aerostat's primary mission is to provide radar data in support of other federal agencies involved in the nation's drug interdiction program.



ARIZONA MILITARY REGIONAL COMPATIBILITY PROJECT

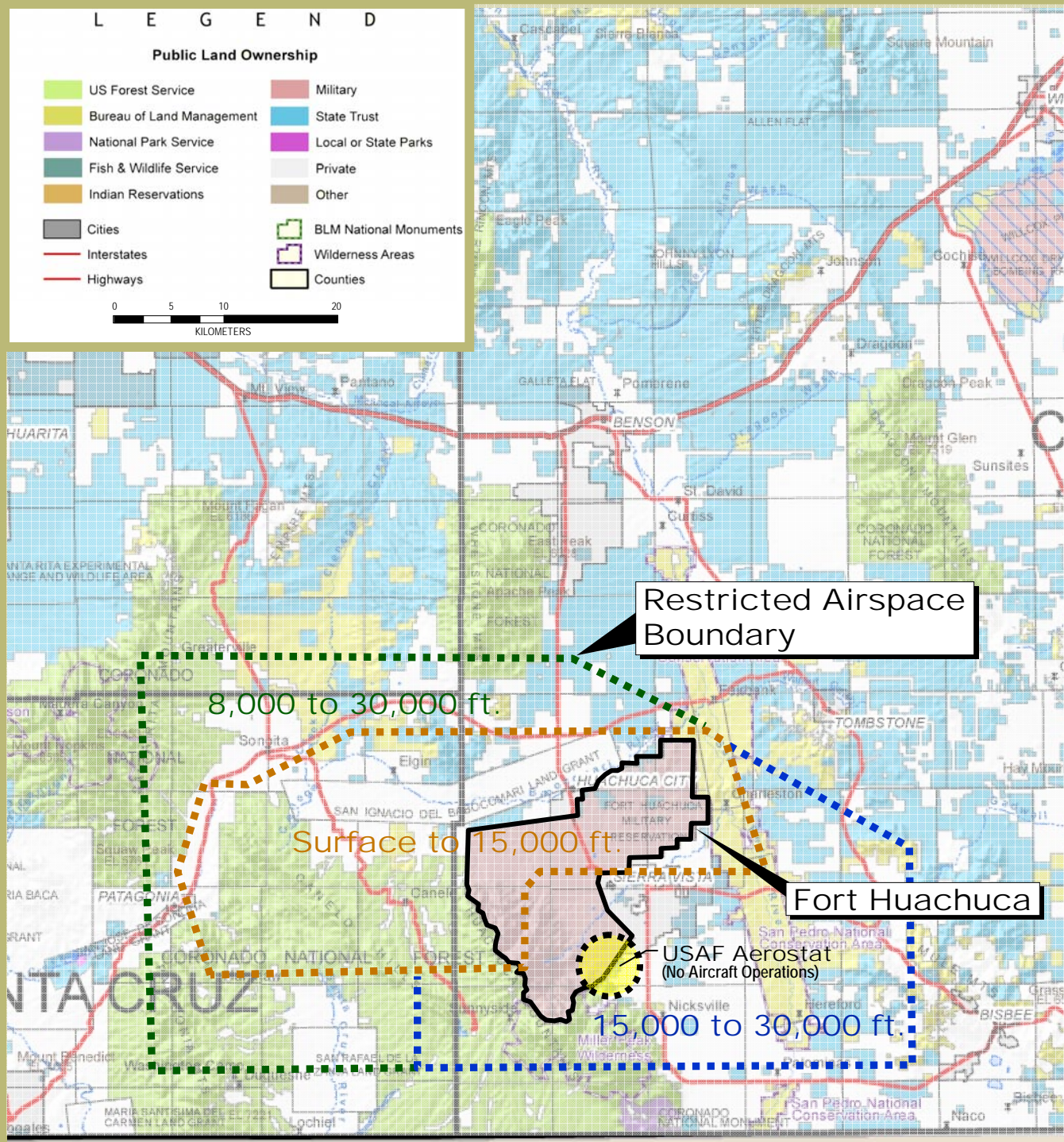
FORT HUACHUCA JOINT LAND USE STUDY

L E G E N D

Public Land Ownership

US Forest Service	Military
Bureau of Land Management	State Trust
National Park Service	Local or State Parks
Fish & Wildlife Service	Private
Indian Reservations	Other
Cities	BLM National Monuments
Interstates	Wilderness Areas
Highways	Counties

0 5 10 20
KILOMETERS



Source: Adopted from Arizona State Land Department, Arizona Surface Management Responsibility Map

Figure 2-7: Restricted Airspace Focus Area Map

Hubbard Assault Strip

The Hubbard Assault Strip, one of only five unimproved dirt assault strips in the continental U.S. and the only one at an elevation in excess of 4,000 feet, is located on the northern portion of the East Range of the Fort, and provides a 5,200-foot long dirt runway used extensively for tactical training. This training conducted with C-130 four-engine transport aircraft consists of low-level flight and nighttime Night Vision Goggle training. In addition, there are four parachute “drop zones” located to the east of Hubbard Strip that are also used for tactical training with low-level flights operating in its vicinity. The primary routes used for “run-in” approaches to Hubbard Strip and the drop zones are shown on Figure 2-8. The approaches to both Hubbard Strip and the drop zones from the east and south occur primarily over the Fort’s East Range. However, the westerly approach to the drop zones and the northwesterly approach to Hubbard Strip operate over lands outside the Fort’s boundary.

Recognizing the potential for encroachment in the area affected by operations at the Hubbard Assault Strip, the Babocomari Area Plan was adopted by the Cochise County Board of Supervisors on September 6, 2005. This Plan includes several policies intended to reduce the potential for incompatibility between operations at Hubbard Strip and development in the area to the north of the East Range.

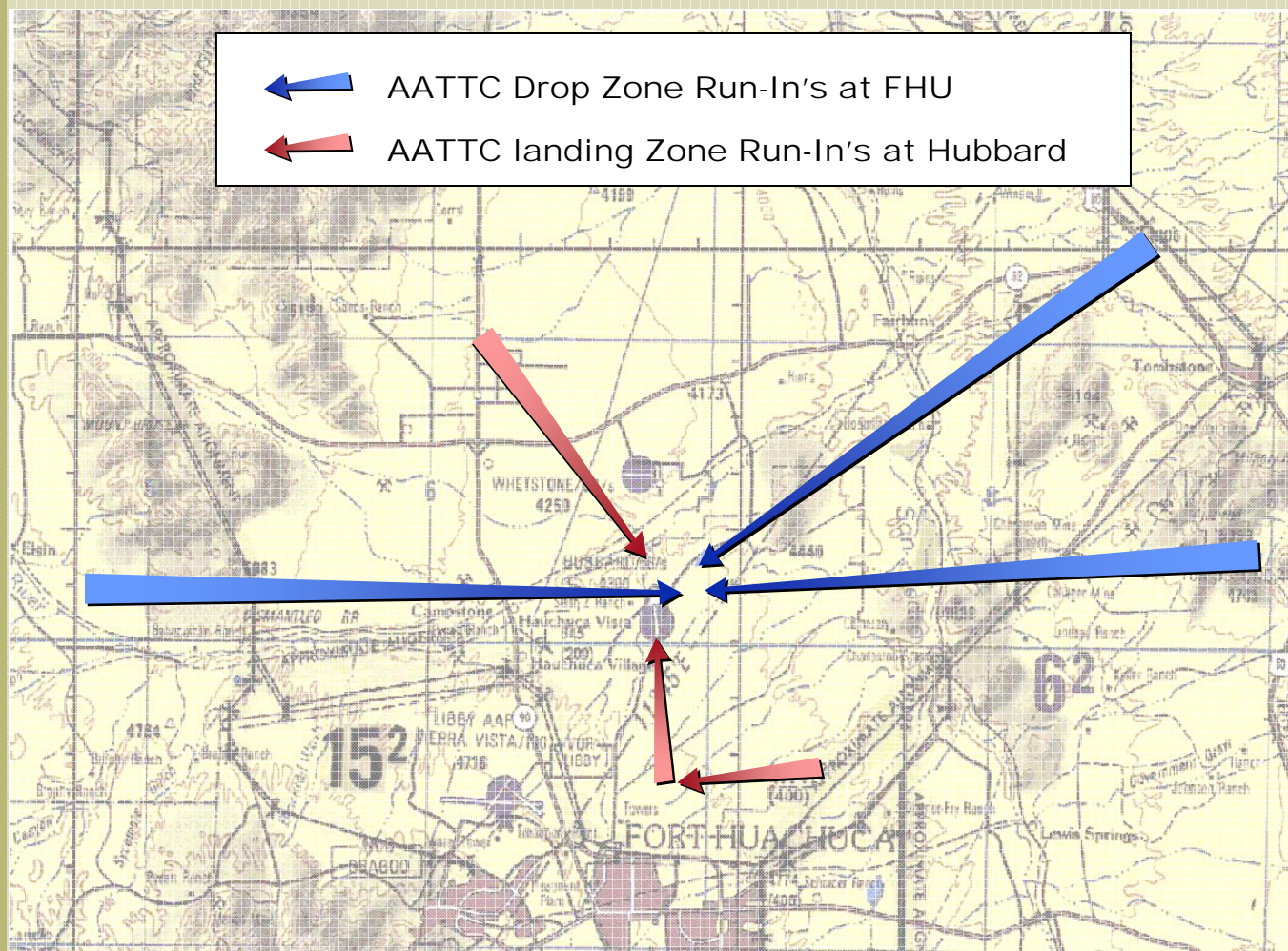
- Gross residential densities in the southern half of the Hubbard Assault Strip Encroachment Area should not exceed one residence per 3 acres.
- Sellers will provide disclosure of the Hubbard Field Encroachment Area (HFEA) and military activities to potential buyers of lots, as well as provide a disclosure notice on subdivision plats.
- No special uses will be approved that have the ability to impact the military missions of the East Range.
- Additional light pollution control measures may be considered

The Focus Area for Hubbard Assault Strip is shown in Figure 2-9.



ARIZONA MILITARY REGIONAL COMPATIBILITY PROJECT

FORT HUACHUCA JOINT LAND USE STUDY



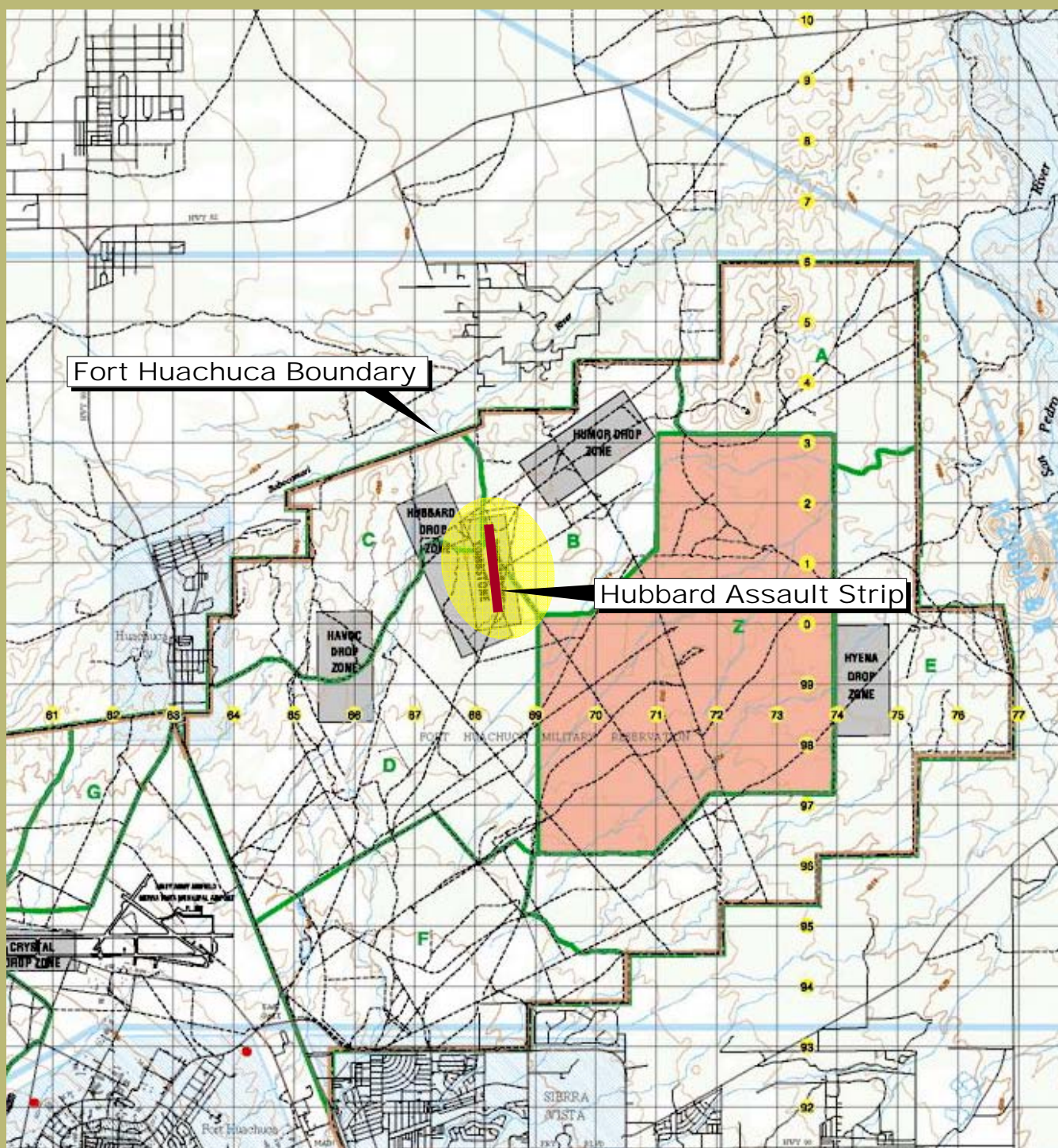
Source: Fort Huachuca, U.S. Army Intelligence Center, 2006

Figure 2-8: Fort Huachuca East Range Aircraft Operations



ARIZONA MILITARY REGIONAL COMPATIBILITY PROJECT

FORT HUACHUCA JOINT LAND USE STUDY



Source: Modified from City of Sierra Vista, AZ

Figure 2-9: Hubbard Assault Strip Focus Area Map

Libby Army Airfield

Libby Army Airfield (AAF) is located to the north of the Fort Huachuca main post, west of State Highway 90. Libby AAF is unique to the Army because it is used jointly by military and civilian activities. In addition to UAV operations, Libby Army Airfield is used by the Arizona Air National Guard for F-16 training and for training of A-10 pilots from Davis-Monthan Air Force Base. It is also a joint-use airfield, with the runways, taxiways, navigational aids, and air-traffic control shared by military and civilian operations. Civilian operations are concentrated on the northern side of the airfield, accessible from the City of Sierra Vista, while military operations are concentrated on the southern side. The 12,000-foot east-west primary runway will accommodate any military or civilian aircraft, and there are two other auxiliary runways. Libby AAF also has control of almost 950 square miles of restricted airspace as described earlier in this document.

Under Section 28-8461 of the Arizona Revised Statutes (ARS), Libby AAF is defined as a “Military Airport” and therefore is subject to the provisions of the Statutes concerning such facilities. Under the ARS, a “Territory in the Vicinity of a Military Airport” is defined for Libby AAF, within which notification to purchasers of property that is within the Territory is required. Section 28-8461 also defines a “high noise or accident potential zone” for Libby AAF, within which certain land uses are restricted. The Focus Area for Libby AAF consists of the portions of the “Territory in the Vicinity of a Military Airport” and the “high noise or accident potential zone” that are outside the boundaries of Fort Huachuca (see Figure 2-10).

Unmanned Aerial System Training Battalion Training Center / Black Tower Complex

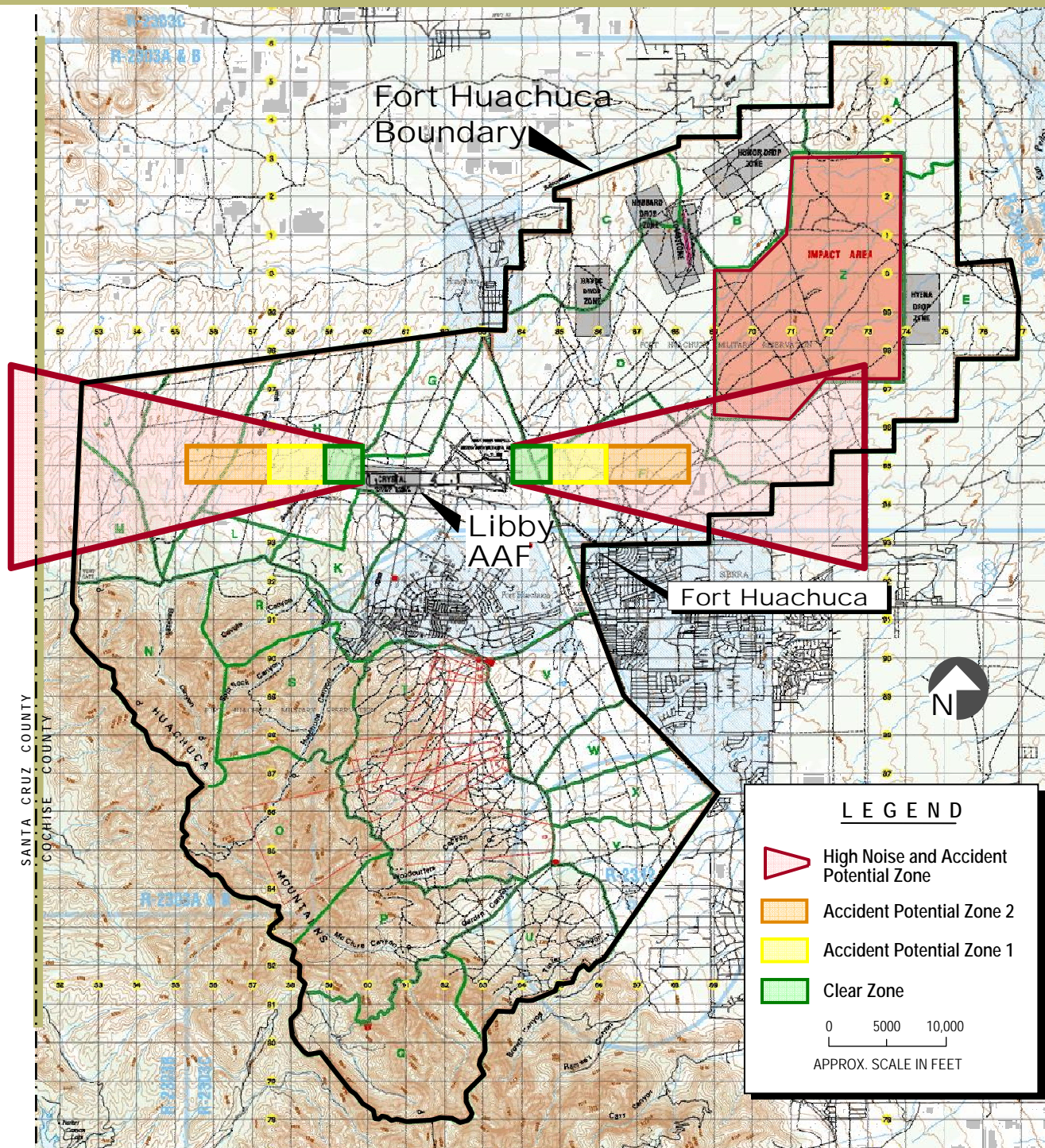
The Black Tower Complex is the largest and most modern Unmanned Aerial System (UAS) training facility in the world, encompassing approximately 300,000 sq. ft. of modern facilities, including training facilities, maintenance bays, flight operations center, etc. The training facilities at the complex contain 22 modern, premier, training simulators along with multiple classroom environments (lecture, maintenance bays, etc.) to support the different training programs. With 350 flying days per year, this is the premier UAS range in the United States, due in large part to the Restricted Airspace controlled by Libby AAF that surrounds the Fort.

The Unmanned Aerial System Training Battalion (UASTB) operates from the Black Tower training complex near the northwestern Fort boundary. The UASTB began operating at Fort Huachuca in April 2006, and took operational control of the UAV training mission from the U.S. Army Intelligence Center. As a reporting element to the U.S. Army Aviation Center at Fort Rucker in Alabama, the UASTB is responsible for training all the U.S. Army UAV operator/pilots and sensor payload and aerial platform system maintenance personnel. Annual throughput averages approximately 600 to 800 students per year. Currently, the UASTB trains U.S. Army and U.S. Navy personnel on the Shadow 200 Tactical UAS with future plans for U.S. Marine Corps integration as well as other foreign military services. In addition, the RQ-5A Hunter legacy system is trained to U.S. Army personnel currently with plans to migrate to a predator based airframe by approximately year 2008.



ARIZONA MILITARY REGIONAL COMPATIBILITY PROJECT

FORT HUACHUCA JOINT LAND USE STUDY



Source: Modified from City of Sierra Vista, AZ

Figure 2-10: Libby AAF Approach and Departure Corridor Map

The Black Tower complex supports the UASTB along with the Program Manager UAS (Program Manager (PM)-UAS) on its two runways. The UASTB uses the Rugge-Hamilton runway, a paved 2000 ft runway dedicated for training use. The PM-UAS flies out of the larger Pioneer strip consisting of a paved 2,500 ft runway and uses this part of the complex for new system acceptance testing of Shadow systems coming into the Army's operational inventory. All new systems are tested on the Pioneer strip before final acceptance by the Army.

The Focus Area for the UASTB and Black Tower Complex shown in Figure 2-11 includes lands that are adjacent to the Fort to the west and north. However, the use of the Restricted Airspace as shown in Figure 2-7 is critical to the mission of the UASTB and therefore encroachment issues affecting the UASTB and Black Tower Complex are not only limited to lands adjacent to the Fort.

Willcox Playa

The Willcox Playa is located approximately 25 miles northeasterly of the Fort Huachuca and is under the jurisdiction of the Fort. Formerly the Willcox Dry Lake Bombing Range, it is no longer used for artillery operations. The Willcox Playa is located at the northeasterly edge of the Fort's Electronic Range and is the location of several receiving / transmitting facilities operated by the Fort.

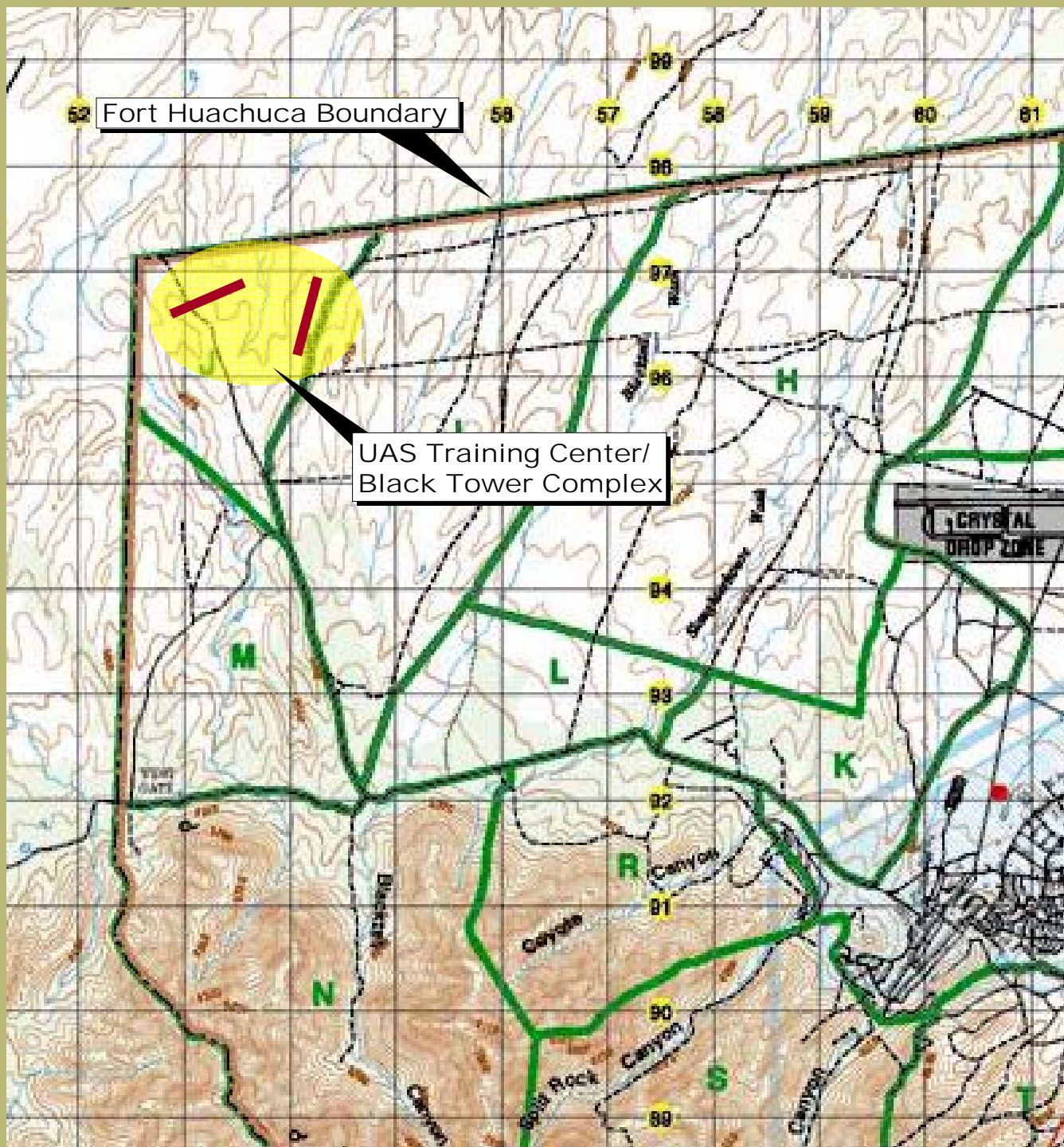
A specific Focus Area for the Willcox Playa has not yet been defined pending further definition of the current and future mission needs related to the Playa. Figure 2-12 shows land ownership in the vicinity of the Playa.

Sunnyside

The Sunnyside area is located to the southwest of the Fort, and includes portions of the Coronado National Forest, along with several private "in-holdings" shown in white on Figure 2-13. The location of the Sunnyside area on the south side of the Huachuca Mountains, which provide shielding from electromagnetic emissions in the San Pedro Valley, along with the lack of development on the National Forest lands provide an extremely quiet electronic environment and the Fort, through a use agreement with the Department of the Interior, plans to use several sites within the Sunnyside area for certain testing and training requirements. The Focus Area boundary for the Sunnyside area is depicted in Figure 3-13.



ARIZONA MILITARY REGIONAL COMPATIBILITY PROJECT
FORT HUACHUCA JOINT LAND USE STUDY



Source: Modified from City of Sierra Vista, AZ

Figure 2-11: UAS Training Center / Black Tower Complex Focus Area Map



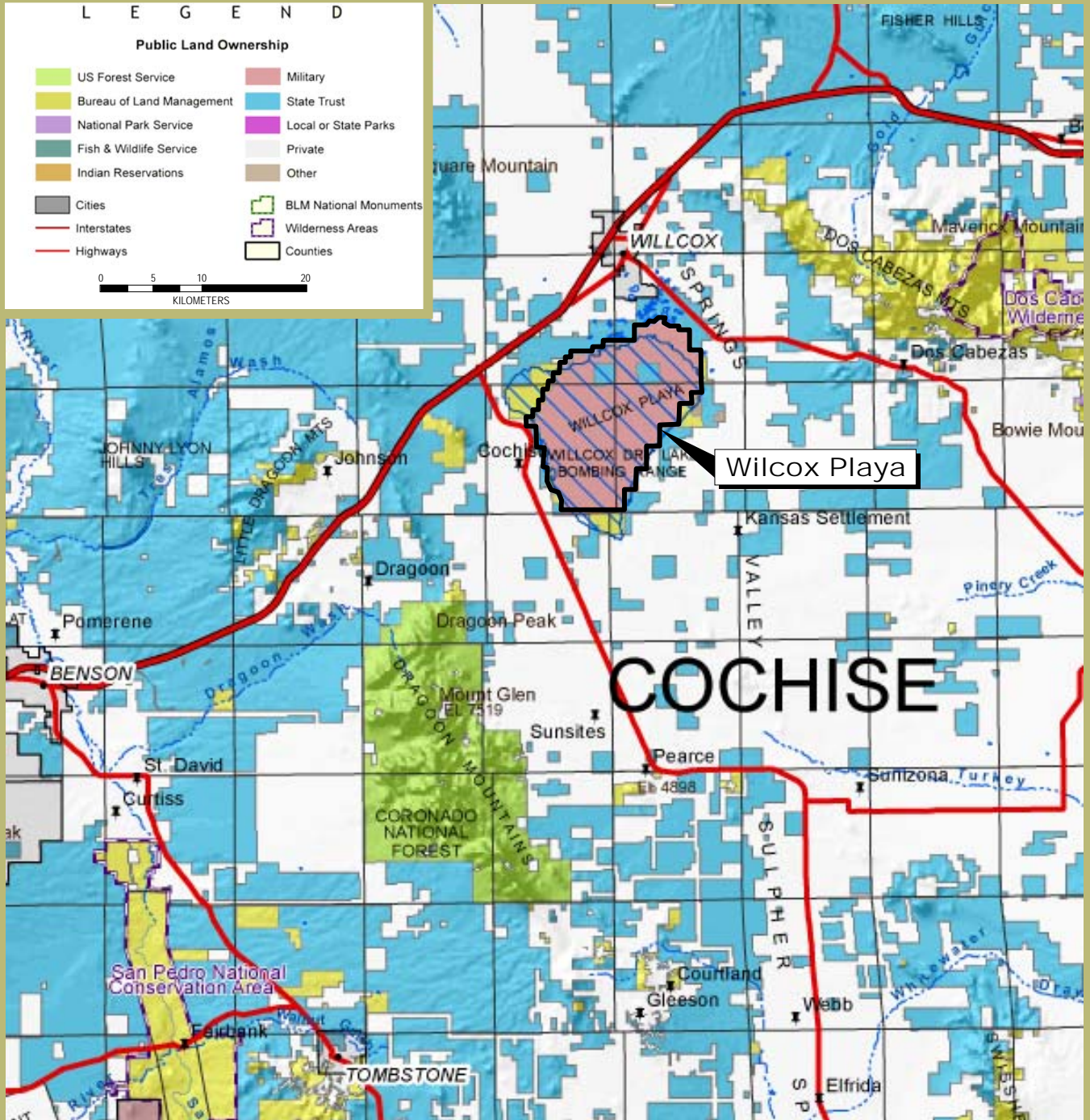
ARIZONA MILITARY REGIONAL COMPATIBILITY PROJECT

FORT HUACHUCA JOINT LAND USE STUDY

L E G E N D

Public Land Ownership

- | | |
|---|---|
| US Forest Service | Military |
| Bureau of Land Management | State Trust |
| National Park Service | Local or State Parks |
| Fish & Wildlife Service | Private |
| Indian Reservations | Other |
| Cities | BLM National Monuments |
| Interstates | Wilderness Areas |
| Highways | Counties |



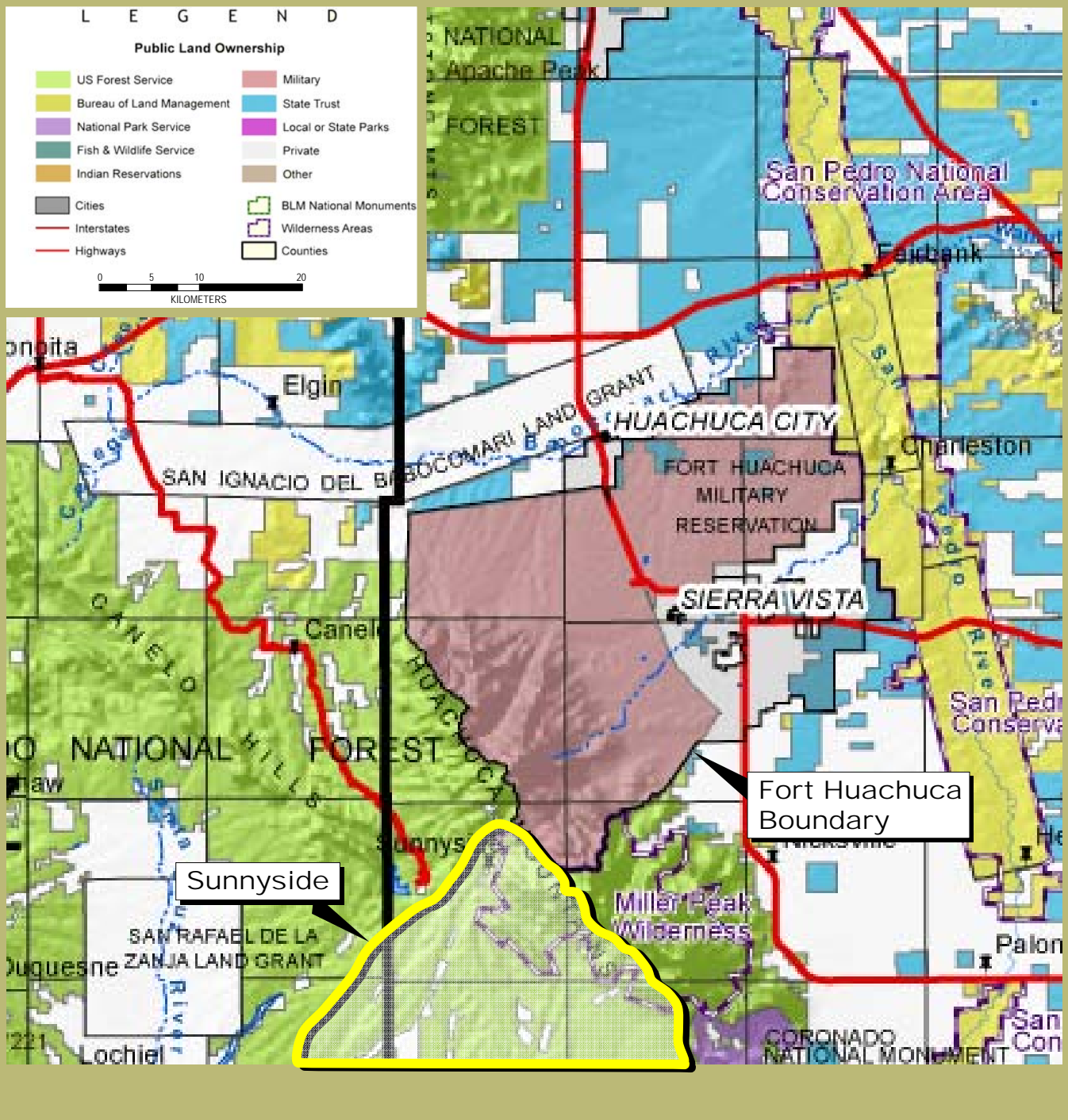
Source: Adopted from Arizona State Land Department, Arizona Surface Management Responsibility Map

Figure 2-12: Wilcox Playa Vicinity Map



ARIZONA MILITARY REGIONAL COMPATIBILITY PROJECT

FORT HUACHUCA JOINT LAND USE STUDY



Source: Adopted from Arizona State Land Department, Arizona Surface Management Responsibility Map

Figure 2-13: Sunnyside Focus Area Map



3. REVIEW OF EXISTING LEGISLATION

Land use within the vicinity of Fort Huachuca is regulated primarily by county and municipal laws and regulations. However, the guidelines of the Department of Defense's Air Installation Compatible Use Zone program apply to Libby Army Airfield, as do the State of Arizona Statutes (ARS) (primarily ARS §28-8481 and §28-8482) concerning military airports. These measures contain the best available current guidance for land use compatibility for military airports and therefore this chapter includes a discussion of that guidance. Land use compatibility in the electromagnetic environment, which is critical to Fort Huachuca's mission, has not been the subject of similar guidance at the Federal or State level. However, the National Telecommunications and Information Administration (NTIA) has adopted regulations to limit electronic interference in the vicinity of Fort Huachuca. The nature and status of the existing land use compatibility guidance (including federal, State and local guidelines and regulations) are addressed in the following sections.

3.1 DEPARTMENT OF DEFENSE AIR INSTALLATION COMPATIBLE USE ZONE PROGRAM

The Air Installation Compatible Use Zone (AICUZ) Program was implemented in 1973 by the U.S. Department of Defense to promote compatible land use development around military airfields. The AICUZ Program creates standard land-use guidelines for areas affected by possible noise exposure and accident potential combinations and provides local government jurisdictions with information that can be used to regulate land use and development. Included in the AICUZ program is a table of accident potential zones, noise zones, and guidance concerning the compatibility of various uses.

The Department of Defense adopted the NOISEMAP computer model to describe noise impacts created by aircraft operations. NOISEMAP is one of two Environmental Protection Agency (EPA) approved models. The other is the Integrated Noise Model (INM), which is used by the Federal Aviation Administration (FAA) for civilian airports.

In 1974, EPA designated the noise descriptor "Ldn," or Day-Night Average Sound Level as the standard measurement for noise impacts. Ldn refers to the average sound level exposure, measured in decibels, over a 24-hour period, with a 10-decibel penalty added to sound levels for operations occurring during the hours of 10 p.m. to 7 a.m. This penalty is applied due to the increased annoyance created by noise events that occur during this time.

Accident Potential Zones (APZs) are one aspect of the AICUZ program where military application differs from civilian airfields. An analysis of aircraft accidents worldwide within 10 nautical miles of a military airfield for the period of 1968–1972 led to defining areas of high accident potential known as the Clear Zone (CZ), Accident Potential Zone I (APZ-I), and Accident Potential Zone II (APZ-II). The majority of these accidents (about 52 percent) occurred within the Clear Zones or APZs, while about 23 percent were associated with the runway and 25 percent occurred in other areas within 10 nautical miles.

It was concluded from the Department of Defense accident study that the Clear Zone warranted special attention due to the high potential for accidents that severely limited acceptable land uses. (Note that the Navy/Marine Corps Clear Zones have different dimensions than the Air Force Clear Zones.) The percentages of accidents within the two APZs are such that some land use control is essential. The Department of Defense recommendation for the APZs is to limit the number of people exposed to noise and safety hazards through appropriate land use planning.

3.2 NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION (NTIA) REGULATIONS AND PROCEDURES

Paragraph 8.3 of the Manual of Regulations and Procedures for Federal Radio Frequency Management published by the National Telecommunications and Information Administration (NTIA) of the U.S. Department of Commerce establishes two areas around Fort Huachuca within which radio frequencies that could affect the U.S. Army Electronic Proving Ground (EPG) are managed.

- A “Coordination Zone” is established within which each Federal agency having radio operations in the coordination zone must notify the Area Frequency Coordinator, Fort Huachuca, or the Army IRAC Representative, of the frequency, power, location, and type emission of the radio operations.

The coordination zone is defined as an area bounded by connecting lines running along Highway 80 from Tucson to Bisbee, due south from Bisbee to the international border, west along the border to a point due south of Dateland, due north to Dateland, along Highway 80 from Dateland to Gila Bend, and along Highway 84 from Gila Bend to Tucson (traffic on Highways 80 and 84 excluded).

- A “Noise Minimize Zone” is established extending 24 kilometers from Fort Huachuca within which transmissions of mobile stations shall be minimized to the extent feasible. Specifically, within the Noise Minimize Zone, signal levels should not exceed the following limits:

10-540 kHz	20 millivolts per meter
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20-54 MHz	50 millivolts per meter
54-148 MHz	20 millivolts per meter
above 148 MHz	50 microvolts per meter

3.3 STATE OF ARIZONA LEGISLATION

From the 1990s through 2005, the State of Arizona passed legislation to address the issue of residential development and other compatibility issues around Arizona's military facilities. The major statutes, including ARS §28-8481 and ARS §28-8461, were most recently amended in 2004 through the enactment of House Bill 2140 and House Bill 2141.

With the passage of these bills, the State requires political subdivisions in the vicinity of a military airport, and in the vicinity of "ancillary military facilities" to adopt land use plans and enforce zoning regulations that assure development compatible with the high-noise and accident potential generated by military airport operations. (ARS §28-8461 defines military airports as Luke AFB, Davis-Monthan AFB, MCAS Yuma, Libby AAF at Fort Huachuca, and Laguna AAF at Yuma Proving Ground; ancillary military facilities are defined as Luke Air Force Base Auxiliary Field No.1, Gila Bend Air Force Auxiliary Field and Marine Corps Air Station Yuma Auxiliary Field No.2). Compatibility with high-noise and accident potential is defined through a land use compatibility table included in ARS §28-8481. Under the ARS §28-8481 definitions, residential uses are generally considered incompatible in the high-noise and accident zones, while many non-residential uses are considered compatible in high-noise zones, and certain non-residential uses may be considered compatible in accident zones.

State legislation, specifically ARS §28-8481, also regulates land uses in hazard zones and high-noise areas, but allows a landowner to undertake development of property for which a development plan was approved before December 31, 2000, (or for lands subsequently added to "territory within the vicinity of a military airport or ancillary military facility", December 31 of the year the land was added) even though the uses may not be compatible with the regulations under ARS §28-8481. It is the responsibility of the local jurisdiction and landowner to work cooperatively on these "grandfathered" plans to mitigate potential future development conflicts where possible.

Arizona Statutes (ARS §28-8481 and §28-8482) require that any city, town or county that has territory with the vicinity of a military airport or ancillary military facility as defined under ARS §28-8461 incorporate sound attenuation standards in their building codes for residential and other noise-sensitive uses in high-noise zones, in order to achieve an indoor noise level of 45 dB. For residential buildings within the defined territory in the vicinity of a military airport or ancillary military facility but outside the high-noise zones, ARS §28-8482 requires construction with a minimum of R18 exterior wall assembly, a minimum of R30 roof and ceiling assembly, dual-glazed windows and solid wood, foam-filled fiberglass or metal doors to the exterior (or alternative means to achieve a 45 dB interior noise level).

In December 2003, the Governor's Military Facilities Task Force put forth twenty-seven recommendations to ensure long-term retention of the State's military facilities so that they may continue to perform their vital national defense functions and maintain their critical role in the State economy. Included in these recommendations were establishment of a permanent Military Affairs Commission, and establishment of a Military Installation Fund with a dedicated stream of funding.

On May 17, 2004, the Governor signed House Bill (HB) 2140, a comprehensive military bill that included a number of the Task Force's recommendations, including the establishment

of the Military Affairs Commission as a permanent body and the establishment of the Military Installation Fund (MIF).

Under ARS §28-8482 the Military Affairs Commission is comprised of fifteen voting members: three appointed by the President of the Senate, three appointed by the Speaker of the House of Representatives and nine appointed by the Governor:

The Commission's duties are to:

- Regularly meet with the Governor, President of the Senate and Speaker of the House of Representatives to provide recommendations on military issues and report on the progress of the Commission.
- Develop criteria, including accountability, for awarding monies from the Military Installation Fund.
- Annually recommend a priority listing of monies with available resources.
- Recommend how the monies in the Military Installation Fund should be awarded.

Beginning in fiscal year 2004-2005 and continuing in each successive fiscal year, \$4.825 million dollars will be appropriated from the state general fund for the MIF. ARS §41-1512.01 identifies specific disbursement components that must be adhered to including:

- Eighty percent of the monies in the fund shall be used for private property acquisition for the purpose of preserving a military installation; acquisition of real estate and rights to real estate and otherwise preserving real estate from development or mitigating impacts on development in high noise or accident potential zones and in areas as required to support a military installation; and, acquisition of real estate, property rights and related infrastructure that is vital to the preservation or enhancement of a military installation. Twenty percent of this amount may be awarded to cities, towns and counties for land acquisition purposes.
- Twenty percent of the monies in the fund shall go to cities, towns and counties for military installation preservation and enhancement projects.
- Monies in the MIF may be awarded for debt service on bonds issued by a political subdivision for the purpose of acquisition of private property for preserving a military airport or ancillary military facility.

In 2004, legislation was also enacted that required that the public report issued by the State Commissioner of Real Estate prior to sale of land include disclosure of location of the property under a Military Training Route, and directed the State Real Estate Department and State Land Department maintain maps of the Military Training Routes. The legislation also provided that in each county that includes land under a Military Training Route, the Real Estate Commissioner record a document disclosing the that the land is under a Military Training Route.

Enactment of House Bill (HB) 2308 in 2005 amended ARS §33-422 to amend the disclosure requirements for sellers of five lots or fewer (other than subdivided land) in unincorporated areas to include location of such property in clear zones, high noise zones or APZs as

defined in ARS §28-8461 or under restricted airspace. HB 2308 also directs the State Land Department to prepare a map of restricted airspace and transmit a copy to all counties.

Appendix A summarizes the provisions of the various statutes related to the operation of military installations. The complete text of these statutes may be found at: www.azleg.gov/ArizonaRevisedStatutes.asp A comparison of the land use compatibility guidance contained in ARS §28-8481 with that of the Air Installation Compatible Land Use (AICUZ) Program is contained in Appendix B.

3.4 LOCAL JURISDICTIONS

Regulations that typically are implemented by local political jurisdictions include zoning (which may include airport zoning, or airport impact and noise overlay districts), and building code requirements for noise attenuation. In addition, local political jurisdictions adopt General Plans (for cities and towns) and Comprehensive Plans (for counties) that are required to address land use compatibility around military installations. Local jurisdictions may also adopt Area Plans or Specific Plans; these also may address issues of encroachment and land use compatibility. Local jurisdictions may also adopt notification requirements in areas surrounding the installation. The following discussion presents an overview of the land use compatibility measures adopted by jurisdictions around Fort Huachuca.

3.4.1 Zoning

The City of Sierra Vista has adopted an Airport Airspace District to control encroachment of structures within the airspace immediately surrounding public airports. These regulations are intended to control the height of buildings and other obstructions within defined Approach and Transition surfaces (based upon Federal Aviation Administration guidance). Most of these surfaces lie within the boundaries of Fort Huachuca. The regulations also provide that:

“No use shall be made of land underlying the surface boundaries of any zone created by this article in such a manner as to create electrical interference with radio communication of the airport or aircraft; make it difficult for flyers to distinguish between airport lights and others; result in glare in the eyes of flyers using the airport; impair visibility in the vicinity of the airport or otherwise endanger the landing, taking off, or maneuvering of aircraft.”

The Sierra Vista Airport Airspace District may be found at: www.ci.sierra-vista.az.us/Community%20Development/DevCode/22.028%20Airport%20Airspace.pdf

3.4.2 Cochise County Plans

Comprehensive Plan

The County's Comprehensive Plan, adopted in 1984 and amended through 2006 has as a major focus the designation of growth areas around existing communities (unless otherwise approved through a master development plan process). Thus growth areas are defined around the Cities of Sierra Vista, Huachuca City, Benson, Willcox and Tombstone. A growth area is also defined for the Whetstone area to the north of the Fort, and a Draft Community Plan for the Whetstone Area has been prepared. An Area Plan has also been

adopted for the Babocomari Area located southeast of the Whetstone Area and north of the Fort's East Range. The Comprehensive Plan and Babocomari Area Plan may be found at: www.cochisecounty.com/P&Z/Comprehensive.htm. The Draft Whetstone Community Plan may be found at: www.co.cochise.az.us/P&Z/index.htm.

Babocomari Area Plan

Among the issues addressed in the Babocomari Area Plan, adopted in September 2005 were to determine the appropriate types and density of land uses in the high priority encroachment area associated with the Hubbard Assault Strip in Fort Huachuca's East Range. To address this issue, the Plan includes the following policies:

Policy 1.1 New land uses should be compatible with adjacent existing uses, particularly with historic ranching, mining, rural-residential and military activities and should incorporate setbacks, vegetative and visual screening, and noise attenuation measures into project design to mitigate potential impacts associated with proximity to these historic land uses.

Policy 1.3 The use of conservation tools, such as fee-simple acquisition, conservation easements, and conservation subdivision options, are encouraged and supported by this plan to protect washes, open space, wildlife corridors and the hydrologic functions of the Babocomari River.

Policy 1.4 Developers of property should provide disclosure to future buyers of military activities in the air space over the Plan Area, as required by ARS §33-422, and all new subdivision plats should include a note about military as well as private airfield activities in the area.

The Plan also identifies specific policies for the Hubbard Assault Strip Encroachment Area including:

- Gross residential densities in the southern half of the Hubbard Assault Strip Encroachment Area should not exceed 1 residence per 3 acres.
- Sellers will provide disclosure of the Hubbard Field Encroachment Area (HFEA) and military activities to potential buyers of lots, as well as provide a disclosure notice on subdivision plats.
- No special uses will be approved that have the ability to impact the military missions of the East Range.
- Additional light pollution control measures may be considered Draft

Whetstone Community Plan

The Draft Whetstone Community Plan (as revised through January 23, 2007) established a vision for the Whetstone area: "Projecting into the future, the Whetstone community will maintain its safe and stable rural residential community identity as characterized by environmental stewardship, protecting existing scenic quality, large residential lot sizes (two acres or larger), and limiting businesses to those that enhance the community." To this end, the Draft Land Use Designations in the Plan maintain a Rural designation for most of the Plan area, with higher intensity uses generally confined to the designated "Growth Area" along Highway 90.

3.4.3 City of Sierra Vista General Plan

The City of Sierra Vista General Plan, “Vista 2020,” was adopted in 2003 and contains Goals and Strategies for the City’s development. Among the Goals are Goal 2-6, to “Minimize conflicts between land uses using appropriate performance standards and design guidelines” and Goal 5-1, to “Target growth to identified growth areas”. Strategies for achieving both of these goals include coordinating with the Fort on development plans and growth areas. The Economic Development Element of the Plan also recognizes that the City’s economy is largely dependent on the Fort. The growth areas identified in the General Plan are located generally to the south and west of the existing developed portions of the City, away from the major operational areas of the Fort.

3.4.4 Noise Attenuation

Interior noise level reductions within the Territory in the Vicinity of a Military Airport, as defined for Libby Army Airfield in the Arizona Revised Statutes are addressed in the International Building Code adopted by the Cities of Sierra Vista and Huachuca City and Cochise County. The City of Sierra Vista and Cochise County are in the process of updating their Building Codes to conform with the requirements of the Arizona Revised Statutes.

3.4.5 Control of Light Pollution

Cochise County has adopted a Light Pollution Code to “specify and encourage lighting practices and systems that will minimize the adverse man-made light pollution effects of sky-glow, glare and light trespass.” The complete Light Pollution Code may be found at: www.co.cochise.az.us/P&Z/2005%20Approved%20Cochise%20County%20LPC%201-13-06.htm

Provisions of the Code include:

- Light trespass and off-site glare are not allowed.
- All lights must be fully shielded except:
 - Low voltage or solar landscape lighting rated at 10 watts or less;
 - A limited number of lights with less than 1,000 lumen output (such as a 60 watt incandescent or quartz halogen or a 13 watt compact fluorescent fixture);
 - One flagpole light (2,000 lumens or less).
- All lights within 25 feet of a residential property must be fully shielded.
- Lumen caps are established by zoning and use.
- Floodlights (incandescent or PAR not exceeding 2,000 lumens) are exempt from lumen caps provided they are aimed no more than 45 degrees (halfway between straight down and straight to the side) and are controlled by a motion sensor device, not to remain on over 10 minutes.
- Lighted Outdoor Recreation Facilities and Waivers from the Light Pollution Code standards require a Special Use Permit.
- Temporary exemptions for emergencies exceeding 48 hours require Planning Department approval.



4. DEVELOPMENT TRENDS AND ISSUES

Growth trends and increased tempo of development around Fort Huachuca are creating issues of compatibility that directly and indirectly affect the ability of the Fort to carry out their present and future missions. The major, current trend in the project study area affecting Fort Huachuca is new housing and related facilities, accompanied by less dramatic growth of the commercial and industrial sectors. All of this growth is occurring amongst the growth of the telecommunications industry, which involves increased use and dependence on electronic devices and electromagnetic technology. Thus, these growth trends in the study area are creating compatibility issues for two of the Fort's primary missions, the Electronic Range and Restricted Airspace mission, as further discussed in Section 5.

4.1 POPULATION GROWTH

The State of Arizona has seen rapid population growth over the past 40 years, and between 2000 and 2004, according to the State Department of Economic Security, it was the second-fastest growing state with a population increase of 13.7 percent. According to projections prepared by the Arizona Department of Economic Security in 1997, the State as a whole is expected to have a population of over 11 million by 2050, nearly double the estimated population of 5.8 million in 2004 (see Table 4-1.) All parts of the State have shared to some degree in this recent rapid growth. For example, Yuma and Maricopa Counties have been among the fastest growing in the nation. Other counties with military facilities, including Cochise County, are also growing rapidly. Santa Cruz County is experiencing growth rates similar to Cochise County (see Table 4-1). Cochise and Santa Cruz Counties populations are expected to increase by 22.6 percent and 48.5 percent respectively, by 2050. Growth rates within the project study area have been the highest within the City of Sierra Vista; with an approximate 17 percent increase between 2000 and 2006 (see Table 4-2). Though it is not certain that these growth rates will be sustained, it is reasonable to conclude that continued population growth in the study area is likely to continue into the foreseeable future.

4.2 HOUSING DEMAND

Population growth creates demand for new housing units. The number of housing units in the State increased by 12.3 percent between 2000 and 2004 (see Table 4-3.) Although the rate of growth in housing units in the State has been slightly less than the rate of population growth during this time, the actual number of new housing units in the State as a whole averaged over 65,000 per year between 2000 and 2004.

Cochise County grew by an average of 1,450 housing units per year, and Santa Cruz County grew by an average of 900 housing units per year (see Table 4-3). As described in Section 2.1, increasing demand for second homes and retirement communities are driving forces behind the housing demand in Cochise and Santa Cruz Counties, as throughout much of Arizona.

Table 4-1 POPULATION PROJECTIONS FOR ARIZONA AND STUDY AREA COUNTIES					
Jurisdiction	2010 Projected	2020 Projected	2030 Projected	2040 Projected	2050 Projected
Cochise County	147,321	149,990	160,049	167,401	174,556
Santa Cruz County	47,050	55,111	64,459	73,892	84,481
Arizona	6,999,810	7,363,604	8,621,114	9,863,578	11,170,997

(Source: Arizona Department of Economic Security, 1997)

Table 4-2 RECENT POPULATION CHANGE FOR ARIZONA AND STUDY AREA JURISDICTIONS				
Jurisdiction	Census Year 2000	DES Estimate 2006	Number Change	Percent Change
Cochise County	117,755	135,044	17,289	12.8%
City of Sierra Vista	37,775	45,651	7,876	17.3%
Huachuca City	1,751	1,830	79	4.4%
City of Benson	4,711	4,861	150	3.0%
Santa Cruz County	38,381	43,561	5,180	11.9%
City of Patagonia²³	881	907	26	2.9%
Arizona	5,130,632	6,305,210	1,174,578	18.6%

(Source: Arizona Department of Economic Security 2006 Population Estimates and Projections)

²³ The City of Patagonia is located outside the study area, and is the city in Santa Cruz County most near the study area.

Table 4-3 ESTIMATED HOUSING UNITS FOR ARIZONA COUNTIES 2000 to 2004				
Jurisdiction	U.S. Census 2000	U. S. Census Estimate 2004	Number Change	Percent Change
Cochise County	51,126	54,029	2,903	5.7%
Santa Cruz County	13,036	14,858	1,822	14.0%
Arizona	2,189,189	2,458,231	269,042	12.3%

Source: Table 4: Annual Estimates of Housing Units for Counties in Arizona: April 1, 2000 to July 1, 2004 (HU-EST2004-04-04), Population Division, U.S. Census Bureau, July 21, 2005

4.3 EXPANSION OF URBAN AREAS

Fort Huachuca, like most of Arizona’s military installations, was located in a sparsely populated area that experienced relatively low population growth for the the first half of the 20th century. Fort Huachuca was established as a temporary camp in 1877, and the surrounding area was essentially wilderness. Even when the Fort was reactivated in the 1950s, the community of Sierra Vista, which grew up near the Fort’s cantonment, remained a small settlement. Beginning in the 1940s and 1950s, however, the State’s population began to grow rapidly particularly around urban centers such as Tucson. Continued growth for the next 50 years resulted in growth spreading beyond the central cites, so that small communities that had once been on the outskirts became urbanized. The City of Sierra Vista grew from just over 3,000 people in 1960 to over 37,000 in 2000.

The expansion of the State’s urban areas is likely to continue. Population projections for 2050 prepared by the State Department of Economic Security²⁴ indicate that 87 percent of the growth is expected to occur in the State’s three largest metropolitan areas – Phoenix, Tucson and Yuma. The result of this growth will be continued urbanization on the fringe of the urban areas, in addition to growth in the State’s smaller urban areas. The City of Sierra Vista’s population is expected to increase to over 61,000 by 2050. As discussed in Section 2, the City of Benson is also anticipated to expand, and has the greatest growth potential of any area within the County.²⁵ The City’s population is expected to grow from 4,861 to 5,752 by year 2015,²⁶ and multiple master planned communities and subdivisions in the City of Benson sphere of influence are in the planning stages.

²⁴ July 1, 1997 to July 1, 2050 Arizona County Population Projections, prepared by the Arizona Department of Economic Security, Research Administration, Population Statistics Unit.

²⁵ Apel. 2007. Personal communication between Mark Apel, Planning Manager of Cochise County, and Brynna McNulty, Senior Planner with Parsons. April 5.

²⁶ Arizona Department of Economic Security and Cochise College Center for Economic Research using U.S. Census data for 1990 and 2000, and Arizona Department of Economic Security mid-year population estimates for 2001 through 2005. Last Updated March, 2006.

Continued development within these and other portions of the study area increases the potential for encroachment and conflicts between the Fort's operations and urban land uses, as discussed further in Section 5.

4.4 CHANGING RURAL ENVIRONMENT

In addition to the expansion of the existing urban areas within the study area, the character of non-urban areas is changing as well. This change in the rural environment is another growth trend occurring throughout Arizona. The development of the study area's rural landscape is occurring through new planned communities, subdivisions, and "lot splits."

As described earlier, demand for second homes, retirement communities and an "exurban" or "small-town" lifestyle has resulted in increased population growth and housing in areas that were formerly rural in character. The major trend is increased development that is simply urbanizing the formerly rural landscape. Another trend to be noted is that the nature of rural residential development is changing, as there is an increasing demand for exurban, second homes. However, these second homes are no longer traditional vacation homes in that they are often similar to first homes in size and level of amenities and tend to be used more frequently than the traditional vacation cabins. Also, second homes tend to later become retirement homes, with full-time occupancy. With more frequent occupancy and greater amenities, the level of incompatibility with impacts such as noise, safety hazards, and EMI increases.

The development of the study area's rural landscape is occurring through new planned communities, subdivisions, and "lot splits." Planned community developments are not a new trend in the study area, however, they are an increasing trend as jurisdictions try to adapt to these new development trends. New residential development occurring on individual parcels, known as "lot splitting" is a new and substantially increasing trend in the study area.

Planned community developments are not a new trend in the study area, however, they are an increasing trend as jurisdictions adapt to new development patterns in rural areas. As discussed further in Section 6, although the introduction of planned community developments may present potential compatibility problems due to the increased density of development, planned communities also present opportunities to maintain compatibility through effective site planning. The Babocomari Area Plan in Cochise County is an example of site planning that resulted in policies written into the plan intended to reduce the potential for incompatibility between the Fort's operations at Hubbard Strip and development in the area to the north of the East Range.

New residential development occurring on individual parcels, known as "lot splitting" is a new and substantially increasing trend in the study area. Unincorporated Cochise County is expected to urbanize largely through the lot splitting trend rather than subdivisions (developments of 6 or more lots).²⁷ Development of residential uses on individual lots in unincorporated areas may occur through platting of a subdivision (defined as six or more parcels), which are subject to county subdivision regulations or, through division of land

²⁷ Call, 2006. Fort Huachuca Joint Land Use Study Policy Advisory Committee Meeting Minutes. Item No. 26. December 14.

into five or fewer parcels. If the division of land does not include a parcel that is 10 acres or smaller, it is not subject to any county review; if it includes a parcel of 10 acres or smaller the land division is subject to staff review (but not legislative approval), provided that the county has adopted an ordinance requiring such review. The staff review is limited to conformance of the parcel size with applicable zoning regulations; availability of legal access; adequate physical access to each parcel; and reservation of appropriate utility easements.

This limited authority for counties to review and approve lot splits that don't go through a subdivision process in unincorporated areas makes it more difficult for counties to ensure that development around military installations will be compatible. All western states, except for Wyoming and Montana, provide for at least some level of county approval of divisions of land regardless of the number or size of parcels involved. Lot splitting is increasingly occurring throughout Cochise and Santa Cruz Counties, and jurisdictions are working to adapt to this trend. For example, the City of Tombstone is targeting adjacent lands to the south for annexation in order to better manage subdivisions increasingly occurring in this area.²⁸ Another case example includes the Babocomari area in Cochise County. Zoning of the San Ignacio del Babocomari Land Grant allows agricultural and large lot rural-residential development on a minimum of four-acre lots. Recently, the eastern portion of the land grant was sold and subsequently the new buyers changed the predominant land use from ranching to residential lot splits of four acres in size and larger. Additionally, new roads were graded into the area and a number of requests to rezone to more intensive residential or commercial uses occurred. Because a portion of this area is adjacent to Fort Huachuca, the change in the trend of development and increased densities raised concerns about future land use compatibility with operations at the Fort's Hubbard Assault Strip. Cochise County worked with land owners, developers and the community to adopt the Babocomari Area Plan in September 2005, which designated a Hubbard Assault Strip Encroachment Area with polices for additional controls on residential density; notification to potential buyers of impacts from the airstrip operations; and limitations on special uses that could have an effect on the military missions of the Fort's East Range.

4.5 CHANGING MILITARY MISSIONS

Fort Huachuca operates in support of the overall framework of a national defense strategy carried out by the U.S. Armed Forces. The defense strategy serves broad national security objectives and evolves in response to changing global trends and concerns in the security environment. The *Quadrennial Defense Review Report*, produced by the Department of Defense, is a strategic planning document that outlines the national defense strategy that guides the development of U.S. Forces and capabilities and their deployment at installations in the U.S. and overseas.

The mission of each of Arizona's military installations, including Fort Huachuca, and of each of the units stationed at the installations, supports the overall national defense strategy. However, these missions also evolve and may change over time to respond to changing security conditions, both internal and external. Changes in the overall national defense strategy resulting from the quadrennial review can lead to eventual changes in an

²⁸ Schmidt, 2007. Personal communication between Steven Schmidt, Chairman of Planning and Zoning for the City of Tombstone, and Brynna McNulty, Senior Planner with Parsons. March 28.

installation or unit mission. Factors such as new technology or combat tactics as well as changing global geopolitical conditions can also lead to changes within the overall defense strategy.

Among the types of mission change that may occur is the introduction of a new unit and mission at Fort Huachuca, or a change in aircraft, weaponry or technology. For example, in 1987 the U.S. Air Force stationed the Tethered Aerostat Radar System at Fort Huachuca in support of other federal agencies involved in the nation's drug interdiction program. This mission involved creation of a surface to 30,000 ft restricted airspace. A recent example in changing missions includes the establishment of the convoy live fire range on the east range of the Fort to allow soldiers to train to shoot out of moving vehicles over an extended course in a convoy type situation. With the addition of the Army's long range ER/MP UAV system in 2008 and the assignment of Arizona Air National Guard Predator UAV Squadron in 2011, it is possible the Fort could see an increase in the requirement to fire live and dummy munitions on the east range.²⁹In addition, some of these UAV systems will employ laser target designation systems which will require the ability to employ these in a range complex as part of the operator training mission. In addition, as these laser designation systems evolve, the requirement to demonstrate and test these new technologies will be part of the Fort's future mission as well.

Changes within an existing mission can also change the impacts of an installation's operations. For example, an increase in the number of missions flown or number of artillery rounds fired can increase the effects of aircraft noise, and also increase the level of safety hazards. New UAV systems planned for the Fort's UASTB mission include UAVs that will operate at higher altitude quieter noise levels than the Shadow system, which is the current system doing most of the flying in the Fort's restricted airspace. Additionally, future mission projections could include the potential return of manned rotary wing aircraft to be used in conjunction with UAV systems.³⁰ The EPG's mission is also likely to evolve with innovations in technology. Thus, compatibility concerns will continue to evolve along with changing military missions at Fort Huachuca.

4.6 DEVELOPMENT OF STATE LANDS

Recent statewide trends in the development of State Trust Land tied to population growth and the expansion of urban areas are creating issues of compatibility that affect the ability of the installations to carry out their present and future missions. As discussed in Section 2, State Trust Land comprises approximately one-third of property located within the study area, and there are extensive expanses of State Trust Land throughout the study area and along the northern and eastern Fort boundaries (see Figure 2-1). Currently, most of Arizona's State Trust Lands are usable for livestock grazing purposes, and approximately 97 percent of leased State Trust Land within the study area is in grazing use (see Table 4-4). For this, there is a great potential for the urban development of State Trust Land, through sales or leases, which could adversely impact the Fort's mission.

²⁹ Walsh. 2007. Personal communication between Matt Walsh, Chief, Strategic Planning Office U.S. Army Intelligence Center at Fort Huachuca, and Brynna McNulty, Senior Planner with Parsons. April 9.

³⁰ Ibid.

Table 4-4 LEASED STATE TRUST LAND WITHIN STUDY AREA		
Trust Land Leased Use	Acres	Percent
Agricultural	297	0.06%
Commercial	992	0.12%
Grazing	487,490	97.30%
Unleased	12,161	2.43%
U.S. Government Exclusive Use	62	0.01%
Total Area	501,001	---

Source: Arizona State Lands Department, 2007.

The Arizona State Land Department manages Arizona’s State Trust Lands, which currently total approximately 9 million acres and comprise approximately 12 percent of land area within the state. The use of all State Trust Land must benefit the Trust, a fact that distinguishes it from the way other public lands may be used and disposed of. Income from the sale or lease of this land benefits a variety of public institutions, with the largest portion benefiting the public school system. During the first 65 years of statehood, the state economy was based on natural resources, and the State Trust Land was primarily leased as rural land for livestock grazing, agriculture, and mineral production. During this time, the State Land Department focused on management of the land for its “highest and best use,” and land was generally not outright sold, as other states had done at the time. However, the focus of the State Land Department’s program has shifted in recent years to reflect the expansion of urban growth throughout the State, from management of rural land to urban and commercial land development. Enabled by several major reform initiatives over the last 20 years, the State Land Department has developed aggressive sales and leasing programs, focused on urban development. One such reform is the Urban Lands Management Act of 1981, which gave the State Lands Department new authority and direction to plan, zone and merchandise State Trust Lands surrounding major population centers. This has allowed the State Lands Department to increase the value of State Trust Land in urban areas by planning and zoning it in cooperation with local governments.

Currently, the urban lands sales and lease program is the largest revenue producer for the Trust. Of 3,426 acres of State Trust Land sold in fiscal year (FY) 2005-2006, 74 percent were urban lands which generated \$484,497,800 in sales for the Trust. This represents an 64 percent increase in land sales over FY 2004-2005. The average sale price per acre of urban land is approximately \$123,400 more than the average acre of rural land within the state (see Table 4-5). Given this trend, management of State Trust Land for urban use primarily through sales would likely continue to generate the most immediate revenue for

the Trust, and without successful reform is likely to remain the focus of the State Land Department management program.

Table 4-5 ARIZONA STATE TRUST LAND SALES FY 2006			
Land Type	Acres Sold	Total Sales Price	Percent of Land Type Sold
Urban	2,538	\$484,497,800	74%
Rural	887	\$59,832,501	26%
Total	3,426	\$544,330,301	100%

As a result of this trend in State Trust Land management, issues of compatibility may rise that affect the ability of Fort Huachuca to carry out their present and future missions. For example, urbanization of State Trust Lands adjacent to Fort Huachuca could create noise and EMI-related compatibility issues. In some cases, State Trust Land sales and subsequent development occurring in a checkerboard pattern encourages private land owners to develop adjacent undeveloped land parcels, which further accelerates development. This trend in State Trust Land sales may further encourage lot splitting in Unincorporated Cochise and Santa Cruz Counties where most State Trust Land is located.

The ability for the State Land Department to engage in land exchanges and density transfers is a potentially important reform element for achieving compatibility. Typically, open space conservation goals are compatible with low intensity land use goals in areas surrounding installations. Such reform requires legislative action and/or a vote of the electorate to modify the State Constitution. Although a recent attempt to provide this important reform through a constitutional amendment was defeated in the November 2004 election, indications are that various groups may support a future measure to provide for such transfers. These proposed reforms as well as other future State Trust Land reform opportunities may be critical to achieving land use compatibility with military installations, and may have a direct, beneficial impact to preserving Fort Huachuca’s missions.

4.7 USE OF FEDERAL LANDS

Land administered by federal agencies comprises approximately 37 percent of land in the study area, as discussed in Section 2. This land is primarily managed by the following federal agencies: USFS (approximately 24 percent), BLM (8 percent), U.S. Army (approximately 5 percent) and NPS (>1 percent). Unlike the Department of State Lands, these federal agencies do not have aggressive land sales programs, and instead issue leases, rights-of-way, and use permits for a wide variety of uses through land management programs. Statewide, the sale of federal land is not creating compatibility issues with military installations, and the open space conservation goals of these federal agencies are generally compatible with low intensity land use goals in areas surrounding installations.

However, in some cases uses of these federal lands is creating, or has the potential to create, issues of compatibility with military installations. Land uses on federal lands may include: agricultural, grazing, timber, minerals, public utilities, roads, recreation, watershed management, fish and wildlife protection, wilderness preservation, scenic resource preservation, military use, scientific uses and cultural resource preservation. With approximately 37 percent of land within the study area in ownership by federal agencies, the leased use of this land has the potential to create compatibility issues.

For example, a large 24-hour mining operation equipped with lighting could create potential incompatibility with nighttime operations due to light impacts. Certain utility facilities may create significant EMI issues that would impact the EPG mission at Fort Huachuca. In addition, intensified recreational use, like RV parks or campgrounds, in the Sunnyside area of the Coronado National Forest could cause EMI issues for this critical component of the EPG mission. Furthermore, in some cases federal properties leased to private parties that have historically been utilized on a seasonal or recreational basis as a hunting cabin or similar use, are being retrofitted to upscale properties that are inhabited on a more than seasonal basis, creating potential noise, light, and EMI compatibility issues.

Development pressures in Arizona continue to place new demands on natural resources, increasing challenges in the management of federal lands for agencies like the BLM, USFS and NPS. At the same time, rising populations are increasing recreational use, creating new challenges for these agencies to manage their land in such a way to accommodate increased use while preserving natural and cultural resources. Maintaining compatibility with adjacent military installations may become increasingly challenging for federal agencies, as development pressures increase throughout Arizona, and management of federal lands will be a critical issue for Fort Huachuca.



5. LAND USE COMPATIBILITY

The ability of any military installation to maintain its operational capabilities is related in large part to the compatibility of the land uses around the installation. Recognizing that local communities have interests both in preserving the capabilities of the installation as well as furthering their own development, it is essential to define land uses that are compatible with the operations of installation, while also contributing to the balanced growth of the local communities. The following sections include discussion of the considerations involved in determining compatibility of land uses and identification of potential approaches for land use compatibility around Fort Huachuca.

5.1 CONSIDERATIONS IN DETERMINING LAND USE COMPATIBILITY

Extensive research and analysis has been conducted to determine the noise and safety considerations involved in the compatibility of land uses with various types of military operations, and these are summarized in the following sections. While the potential for electromagnetic interference and light pollution interfering with military operations have not been studied to the same extent, the compatibility of development in terms of electromagnetic interference and light pollution are critical for Fort Huachuca to carry out its mission, and therefore, potential considerations for these areas are also identified.

5.1.1 Noise Considerations

Noise is “unwanted sound” and can be perceived as a nuisance that disturbs our routine activities or our peace, and that at louder levels may cause feelings of mounting annoyance, irritation, or anger. The loudness of sounds is dependent upon many factors, including sound pressure level and frequency content, and within the usual range of environmental noise levels, perception of loudness is relatively predictable. Sounds that are perceived as noise may vary among listeners and sounds that are not objectionable to some can be bothersome to others.

Aircraft or artillery noise may be experienced as particularly annoying because it may startle people, cause windows to rattle and houses to shake, or cause people to fear a crash or explosion. In addition to varying levels of annoyance, adverse impacts associated with exposure to noise may include interruption of sleep and conversation.

Some common terms used in assessing the effects of noise are:

- The Decibel (dB) is the unit used to measure the magnitude or intensity of sound. Decibel means 1/10 of a Bel (named after Alexander Graham Bell). The decibel uses a logarithmic scale to cover the very large range of sound pressures that can be heard by the human ear. Under the decibel unit of measure, a 10 dB increase will be perceived by most people to be a doubling in loudness (80 dB seems twice as loud as 70 dB).
- The A-weighted Decibel (dBA) is the most common unit used for measuring environmental sound levels. It adjusts, or weights, the frequency components of

sound to conform to the normal response of the human ear at conversational levels. dBA is an international metric that is used for assessing environmental noise exposure of most noise sources.

- The C-weighted Decibel (dBC) is used for measuring sound levels of heavy weapons operation and sonic booms, because it adjusts or weights the frequency components to emphasize higher and lower frequencies and therefore provides a way of capturing the most annoying characteristic of tank guns and artillery, which are house vibrations induced by low frequency sound.

Sound levels are plotted in decibels (abbreviated dB), a logarithmic measure of the magnitude of a sound, and may be plotted as either “A-weighted” (dB(A)) or as “C-weighted” (dB(C)). The “A-weighting” accounts for the fact that humans do not hear low frequencies and high frequencies as well as they hear middle frequencies. The A-weighting corrects for the relative efficiency of the human ear at the different frequencies. Conversely, the “C-weighting” accounts for the fact that low frequencies cause vibration, which is the principal noise impact of heavy weapons firing.

An additional important factor in measuring a sound environment is the occurrence of sound events at night. People are normally more sensitive to intrusive sound events at night and background sound levels are normally lower at night because of decreased human activity. Therefore, a “penalty” may be added to sound levels that occur during night hours. By accepted scientific convention, a 10-decibel penalty is added to sound levels occurring between 10:00 p.m. and 7:00 a.m. the following morning. This 10 dB penalty means that one nighttime sound event is equivalent to 10 daytime events of the same level. The 24-hour average sound level, including the 10 dB penalty, is known as the day-night average sound level (Ldn). Extensive research has found that the day-night average sound level correlates very well with community annoyance from most environmental noise sources, and Ldn is used by all Federal agencies and internationally in the assessment of potential noise impacts.

Relying on a considerable body of scientific research on noise impacts, federal agencies have adopted guidelines for compatible land uses and environmental sound levels. Compatible land uses are normally determined by planning and zoning regulations that segregate types of activities, such as residential, industrial, or commercial. Noise levels that are unacceptable for homes may be quite acceptable for other uses, such as agriculture or certain industries.

General guidelines for noise compatibility identify sound levels from aircraft operations between 55 and 60 dB as “moderate exposure” and as generally acceptable for residential uses. Both the Department of Defense’s Air Installation Compatible Use Zone (AICUZ) guidance and the Federal Aviation Administration’s (FAA) Airport Noise Compatibility Planning Toolkit discourage residential use in the 65 Ldn contour and higher. The Army Operational Noise Management Program uses a classification system of Zones I, II and III (Zone III being the worst) to define noise-impacted areas. Noise levels in Zone II are roughly equivalent to those within the AICUZ and FAA 65 Ldn contour.

5.1.2 Safety Considerations

The primary safety considerations for areas surrounding military installations relate to the operation of military aircraft and their associated weaponry and ordnance. There are two types of airspace environment – the environment surrounding airfields and the environment surrounding ranges, which is a non-airfield environment. Aircraft overflights, take-offs and landings, expose areas around military airports to the possibility of accidents even with well-maintained aircraft and highly specialized flight crews. Despite stringent maintenance requirements and intense pilot and crew training programs, history demonstrates that aircraft related accidents will occur around airports. Risk may be defined as:

The potential for realization of unwanted, adverse consequences to human life, health, property, or the environment; estimation of risk is usually based on the expected value of the conditional probability of the event occurring times the consequence of the event given that it has occurred.³¹

Although the risk to people on the ground of being killed or injured by a military aircraft accident is very small, such an event is by its nature of high consequence and may be catastrophic in the breadth and extent of its impact.

In order to address the issue of public exposure to safety hazards related to flight, the Department of Defense undertook an accident study based on crash patterns for reported incidents between 1968 and 1972. The combined DoD study indicated that:

- a. The majority of accidents occur along the extended runway centerline. Percentages ranged from 65% within five miles for the Navy to 75% within 10 miles for the Air Force, and 97% within one mile for the Army. The analysis supported corridor widths of 3,000 feet for the Navy and Air Force and 1,000 feet for the Army.
- b. Fighter and training type aircraft accounted for over 55% of the total aircraft accidents
- c. Approximately 20% of all accidents occurred on or near the runway. For accidents occurring between the runway thresholds, but off the runway surface, over 94% were within 1,000 ft of the centerline and 1.9% were between 1,000 and 4,500 ft. The Army accident plot showed no accidents occurring outside the existing Army runway lateral clearance zone of 500 ft from the runway centerline, threshold to threshold.
- d. More accidents occurred during the landing phase of flight than the departure phase. Both the Air Force and the Navy experienced nearly twice as many of its accidents during this phase of flight as during the departure phase.
- e. Beyond a distance of 15,000 feet along the extended runway centerline, the number of accidents became insignificant.
- f. The impact areas (areas over which debris is scattered) varied according to aircraft type. The smallest crash areas covered slightly more than two acres, while the impact for heavy bombers in some instances exceeded eight acres. The average impact area was 5.06 acres.

³¹The Society for Risk Analysis, *Risk Glossary*, accessed at <http://www.sra.org>.

- g. Accident plots for various classes of aircraft varied; therefore accident potential zones of different sizes are appropriate for each class of aircraft.

As a result of the study, it was concluded that the designation of safety zones around the airfield and restriction of incompatible land uses could reduce the public's exposure to safety hazards. Recommended dimensions for these zones are based on distribution of accidents and the debris scatter. The land use recommendations for each zone are based on the level of risk; the area of highest risk has the most restrictions, while areas of lesser risk have lesser restrictions. Although safety zones are areas where there is the highest potential for an aircraft mishap based upon historical locations of accidents, these zones do not reflect the totality of the locations where accidents may happen. The safety zones are also discussed in Sections 3.5.1 and 4.1.1 of this document.

In a subsequent Air Force accident study, data was plotted in relation to the airfield for 838 major accidents at U.S. Air Force bases from 1968 through 1995. These were all Class A accidents (defined as involving a loss of life or more than \$1 million worth of damage) that occurred within 10 nautical miles of the airfield. This study showed that the accidents clustered along the runway and its extended centerline. Approximately 43% of the accidents occurred within the clear zones and APZs, approximately 25% occurred on the runway, and approximately 32% occurred in other areas within 10 nautical miles of the airfield. The study also showed that the majority of accidents were associated with landing (61%) vs. takeoff (30%) and that 80% of the accidents were associated with fighter / training aircraft.

An additional consideration related to safety for aircraft operations is that structures that penetrate the airspace can create hazards for aircraft operations. The most critical locations with regard to the height of objects are those within the airport approach zones. Part 77 of Title 14 of the Code of Federal Regulations (Title 14, Part 77 CFR) provides the height limits for structures within FAA-controlled airspace. Under this guidance, the height of structures considered to be obstructions is 200 feet except that in the immediate the height of structures considered to be obstructions is related to a series of "imaginary surfaces", which establish a three-dimensional space in the air above an airport.

Whether a particular object constitutes an airspace obstruction depends upon the height of the object and its proximity to the airport. Generally, the closer the proximity to the airport and to the runway approaches, the less the height that would be considered an obstruction. Any object that penetrates these imaginary surfaces is considered an obstruction and may affect the aeronautical use of the airspace.

The land area and height standards defined in the Tri-Service Unified Facilities Criteria: Airfield and Heliport Planning and Design (UFC 3-260-01) are used for purposes of defining height obstruction criteria around military airfields. UFC 3-260-01 is available on the web at: www.wbdg.org/cfb/DOD/UFC/ufc_3_260_01.pdf. These standards are similar to those used by the FAA under Title 14, Part 77 CFR. Federal law requires that prior notification must be given to the FAA, as the manager of the nation's airspace, regarding any construction or alteration of structures that meet specific criteria. Those structures may include, but are not limited to: buildings, highways, bridges, signs and billboards, antennas and utility poles, as well as temporary-use construction materials or equipment.

5.1.3 Electromagnetic Interference

Because the success of Fort Huachuca in achieving its mission is highly dependent on the proper operation of sophisticated communication systems, electromagnetic interference is an important consideration. An environment free of electromagnetic interference is essential to carry out its training and testing mission using a wide range of electronic equipment and systems.

Electromagnetic interference (EMI) (or radio frequency interference) occurs when an electromagnetic field interferes with the normal operation of an electronic device. Any device that transmits, distributes or processes any form of electrical energy can be a source of EMI. Such interference typically is generated on a small scale due to the operation of everyday items such as cell phones or fluorescent lights, but because the reach of the field from such devices is small, it does not result in problems. However, larger sources of interference, such as telecommunication signal facilities, or other transmitters can create significant problems for other devices using the radio frequencies. With the growth of the telecommunications industry, the increase in dependence on electronic control and guidance systems for aircraft, and the generally increased use of the radio frequency spectrum by an expanded number of users, the potential for adverse effects will likely increase in the future.

Transmitters are designed to emit electromagnetic energy to convey radio frequency signals to receiving devices; interference occurs when the emitted energy is picked up by a receiver that is not the intended recipient of the emissions. Typically, the operating frequency of the transmitter and receiver of the unwanted emissions are in the same frequency bandwidth; the potential for interference decreases as the frequency separation between a transmitter and receiver increases. Interference can also occur when unintended leakage occurs from a device that is not intended to emit energy. For example, properly maintained television cable carrier systems do not radiate much electromagnetic energy. However, malfunctioning of the system may result in significant leakage and consequent interference.

Electromagnetic interference from surrounding land uses can adversely affect military operations in numerous ways. Among these are interference with aircraft guidance systems (including those on the ground as well as in the aircraft itself); interference with the proper functioning of computer hardware; disruption of communications between units during training exercises; and interference with testing of electronic systems and devices. Military operations that transmit electromagnetic energy can also potentially interfere with civilian activities around the installation, such as television and radio reception and operation of computers and medical devices.

An important consideration for avoiding electromagnetic interference is that electronic fields operate according to the inverse square law of physics, which states that a quantity of something such as electromagnetic energy is inversely proportional to the square of the distance from a source point. For example, at twice the distance, $\frac{1}{4}$ of the emissions would be received, while at 10 times the distance, only $\frac{1}{100}$ would be received. For this reason, distance is one of the best methods to avoid electromagnetic interference as the effects decrease more rapidly than the distance increases.

5.1.4 Light Emissions

As development increases, the potential for incompatibility due to uncontrolled light emissions also increases. A variety of military training and testing operations depend upon “night-sky” conditions that can be disrupted by sky-glow and glare from unshielded light sources.

As a form of energy, light emissions are also subject to the inverse square law of physics (as discussed in Section 2.3 above), which means that the more distant the light source, the greater the relative level of reduction in the effects of emitted light. However, the proliferation of light sources in both urban and rural areas increases the likelihood that increased uncontrolled light emissions will create light pollution, especially sky-glow, even when the sources are some distance away.

A common method of reducing the potential for light pollution is to require shielding of exterior light fixtures, so that the light is directed downward rather than out or up. Shielded lights result in less sky-glow and glare and can prevent “light trespass”, which occurs when light falls on property outside that where the light source is located. Cochise County has adopted regulations to address light pollution, among the provisions of which are requirements for shielding of lighting. The ordinance also provides for limits on total light output or luminance (the amount of light falling on a surface); limits on internal lighting of signs; prohibition of searchlights and laser lights for commercial purposes; and prohibition on installation of new mercury vapor light fixtures. The Cochise County Light Pollution Code may be accessed at: www.co.cochise.az.us/P&Z/.

5.2 PRINCIPLES FOR LAND USE COMPATIBILITY

Two critical issues define compatibility of uses: first, exposure of areas outside the installation to safety and noise hazards resulting from installation operations; and second, the potential for interference with installation operations due to certain characteristics of land uses around the installation (such as airspace obstructions or electro-magnetic interference.)

5.2.1 Noise and Safety Hazards

A fundamental goal of compatibility criteria is to avoid concentrations of people exposed to noise and safety hazards, and is achieved in principle by:

- limiting exposure of people and noise-sensitive activities to high noise levels; and
- limiting concentrations of people and safety-sensitive activities in areas of highest probable accident impact.

Each of these critical principles can be translated into specific types of land uses that are affected by military operations.

- Noise-sensitive land uses that are incompatible with high noise levels, particularly within the high-noise zones defined as the 65 Ldn contour and higher (or within Army Noise Zone II, Noise Zone III and Land Use Planning Zone) include:

- Residences and places where people normally sleep such as hotels, hospitals, and nursing homes;
- Uses such as schools, libraries, churches, museums, cultural centers, theaters, hotels, outdoor auditoriums, and concert halls, where it is important to avoid interference with such activities as speech, music, meditation, and concentration on reading or visual material.

Noise attenuation may mitigate the effects of the average noise exposure (as expressed in Ldn), on these uses; however, it is important to note that single-event noise levels at significantly higher decibels may not be fully mitigated by attenuation.

- Land uses that result in concentrations of people or that have special safety considerations are generally incompatible with high hazard areas around military airports. These areas typically include the Clear Zones, APZ-I, and APZ-II as defined under AICUZ guidance, or hazard zones defined under similar criteria. Note that the Navy/Marine Corps Clear Zones have different dimensions than the Air Force Clear Zones. Uses that result in concentrations of people include the following:
 - Residences and similar uses where people reside, such as hotels and nursing homes;
 - Employment uses with a high density of employees such as offices and labor-intensive industrial use;
 - Uses where people may gather in large numbers such as churches, schools, shopping centers, retail establishments, bars and restaurants, auditoriums, sports arenas, and spectator sports.
- Land uses that have special safety considerations include the following:
 - Uses involving significant quantities of hazardous materials or explosives;
 - Critical public health and safety uses, such as hospitals, fire stations, and police communications facilities;
 - Landfills and agricultural row crops that are attractive to large flocks of birds.

5.2.2 Interference with Installation Operations

Compatibility problems due to obstruction or interference can be avoided by following principles concerning obstructions and sources of interference, and by submitting proposals for these kinds of uses to the installation for review.

- The height of structures and other objects (such as trees) in critical airspace should be restricted in accordance with relevant FAA and DoD guidance to avoid obstructions. (See Section 2.2 above for a discussion of guidance concerning airspace obstructions.)
- Uses that transmit electromagnetic energy should be located at sufficient distance from any receivers on the installation to avoid interference with the operation of the receivers. Such uses may include:

- Telecommunications signal facilities;
 - Television and radio transmitting towers;
 - High-voltage electric transmission lines.
- Uses that are sensitive to electromagnetic interference should not be located within areas subject to interference generated by transmitters on an installation. These uses include:
- Residential uses;
 - Educational facilities;
 - Public safety facilities;
 - Data processing facilities;
 - Uses involving explosives or storage of flammable gases.
- All sources of light around the installation should be shielded to avoid adverse effects of light pollution (such as light trespass, glare or sky-glow) on installation operations.

5.3 APPROACHES TO ACHIEVE AND USE COMPATIBILITY

The Fort Huachuca JLUS is intended to guide the decisions made by a variety of public and private entities in relation to compatible land use around the Fort. In addition to the State of Arizona and its agencies, the Fort itself, local jurisdictions, and private interests within the area can contribute to achieving land use that is compatible with the Fort's mission.

There are a number of approaches to achieving compatible land use, ranging from ensuring that land use compatibility is adequately defined and considered in preparing local plans, to ensuring that those affected by military operations are adequately notified of potential effects or achieving compatibility through adoption of regulatory mechanisms or acquisition of property. The Statewide Policy Guidebook, that was prepared as part of the Arizona Military Regional Compatibility Project, includes a comprehensive set of policies and procedures that can be considered to implement land use compatibility (see www.azcommerce.com/Military/Compat/). Those that have particular relevance as part of potential approaches to compatibility for Fort Huachuca include:

- **Enhanced Local Notification and Disclosure** can ensure that those in the vicinity of military operations are adequately notified of potential effects. While notification alone does not result in compatible land use, it can improve community understanding and acceptance of the installation and its mission. Potential measures under this approach could include:
- Posting of maps in real estate and lease offices, model home complexes and other public locations that show safety hazard zones, noise contours for aircraft, and off-base areas that are subject to aircraft overflights.

- Recording of disclosure statements with property deeds to acknowledge properties are subject to aircraft overflights, and may be located within restricted or other special airspace.
- Installing over-flight signage at roadway intersections.

Some of these measures have been included as policies in the Babocomari Area Plan, and similar measures could be considered as a means of improving compatibility within the Fort's Restricted Airspace.

- **Limiting Density of Development** can reduce the exposure of people and property to the effects of military operations. For example, the Babocomari Area Plan limits the maximum density of residential development within the southern portion of the Hubbard Encroachment Zone to the equivalent of one dwelling unit per 3 acres. Limiting or maintaining development density, for example to maintain the densities allowed under existing zoning within the Restricted Airspace or Electronic Range, could reduce the potential effects of incompatibility due to increased density of development.
- **Acquisition of Property or Development Rights** can ensure compatibility by avoiding the development of property for incompatible uses. Two potential avenues for acquisition of property are the Arizona Military Installation Fund (MIF) and the Army Compatible Use Buffer (ACUB) program. The MIF can provide funding for acquisition of property, although under current rules, priority in funding is given to acquisition of property within high-risk accident potential zones, and therefore may be of limited use for Fort Huachuca, where these high-risk zones are located within the installation boundaries.

The ACUB is being implemented under a program that allows the Secretary of the Army to enter into cooperative agreements with other entities (States, political subdivisions, or conservation organizations) in order to address environmental and encroachment issues around military installations. These agreements may provide for fee-simple land purchases, acquisition of development rights, conservation easements and other means in accordance with Section 2811 of the National Defense Authorization Act for fiscal year 2003 (P.L. 107-314), which provided new statutory authority that permits the Department of Defense to enter into such agreements with eligible entities to address encroachment and other constraints on military training and operations, and to accept on behalf of the United States Government any property or interest acquired pursuant to such agreements.

An important element of the ACUB program is that it allows Army funds to be used for the acquisition of property or development rights by a partner without the Army taking a real property or management interest in the land. In most cases, the partner and not the Army would manage the buffer property.

- **Transfer of Development Rights (TDRs)** is also a means of ensuring that the use of property affected by installation operations remains compatible. The use of TDRs can reduce the intensity and density of use in areas

identified as important for preserving the installation's mission while increasing density in other areas by creating incentives for developers to use the density transfer technique in appropriate situations and areas affected by installation operations. The transfer of development rights is similar to the purchase of development rights, except rather than a public agency buying development rights, which are then in effect "retired," the landowner is compensated by having the permitted uses of other land expanded or intensified. Those lands where density or intensity of use is reduced becomes the "sending" zone, while the lands where density or intensity is increased becomes the "receiving" zone. To apply this approach for Fort Huachuca, establishing suitable receiving zones may be difficult in certain areas, due to environmental or other considerations. Also, participation in TDR programs would be voluntary on the part of the landowner(s).

- **Installation Review of Development Proposals** would provide a means of ensuring that major development proposals requiring discretionary approval (such as General Plan amendments, rezonings, special uses and master plans) by local jurisdictions can be reviewed for compatibility by Fort Huachuca, and that the Fort has an opportunity to provide input to the local jurisdictions prior to the jurisdiction's approval of the project. This review should be included as part of each jurisdiction's formal procedures for processing applications for projects that require discretionary approval.

Table 5-1 includes the seven compatibility focus areas for the JLUS study, and for each area provides summary information on the type of mission, the existing compatibility measures in effect, and a listing of the potential compatibility approaches for that area. The seven focus areas are described in Section 2. above.

5.4 LAND USE COMPATIBILITY POLICY IMPLEMENTATION

The Compatibility Approaches are guides and tools to be applied by local political jurisdictions to protect and promote the health, welfare, and safety of the public. The Plan and Policies also recognize that vested development as defined under Arizona Statutes may occur, although not compatible with the Plans, and that existing incompatible uses may be continued although subject to restrictions on their expansion.

Integration of the recommendations for compatible land uses into general and comprehensive plans during the Growing Smarter major amendment process is appropriate implementation. Given that Arizona is a local control State, it is the responsibility of each community to determine which of the approaches are appropriate for each jurisdiction and to implement those decisions through development regulations, land use plan policies and development reviews.

**Table 5-1
RECOMMENDED LAND USE COMPATIBILITY APPROACHES FOR FOCUS AREAS**

FORT HUACHUCA JOINT LAND USE STUDY (JLUS)					
Focus Area	Primary Mission(s)	Jurisdictions	Existing Compatibility Measures	Potential Compatibility Approaches	JLUS Recommendations ³²
1. Electronic Range	<p>Testing of electronic equipment; training in the use of electronic equipment; training and testing involving the use of UAVs. Units using the electronic range include the:</p> <ul style="list-style-type: none"> ○ Electronic Proving Ground (EPG) ○ Intelligence and Electronic Warfare Testing Directorate (IEWTD) of the Operational Test Command (OTC) ○ Joint Interoperability Test Command (JITC) ○ U.S. Army Information Systems Engineering Command (ISEC) ○ NETCOM/9th ASC 	<p>Cochise County Santa Cruz County Sierra Vista Huachuca City Tombstone</p>	<p>NTIA Compatibility Zones for Federal Activities including "Noise Minimize Zone" extending for 24 km around the Installation and a "Coordination Zone" within which the Installation must be notified of Federal activities that could cause electromagnetic interference.</p>	<ul style="list-style-type: none"> ○ Limitations on Density / Intensity of Future Development ○ Installation Review of Development Proposals Requiring Discretionary Action (e.g. rezoning, special use), including consideration of an Overlay Notification Zone ○ Restrictions on Electromagnetic Interference (Performance Standards) ○ Prohibition of Uses Known to Cause Electromagnetic Interference ○ Requirements for Electromagnetic Compatibility Zones Expanded to All Activities 	<ul style="list-style-type: none"> ○ Notification Measures (i.e. Uses within the area of the Electronic Range are Subject to Electronic Interference) <ul style="list-style-type: none"> - Signage Along Major Roadways - Formal notice to purchasers of property and tenants - Recorded on Property Deeds ○ Formal Procedures for Installation Review of Major Development Proposals (e.g. Rezoning, Special Uses, Master Plans) ○ Formal Procedures for Installation Review of Arizona State Lands major actions within the Electronic Range.

³² For a complete discussion of recommended JLUS implementation strategies, please see Chapter 6.

**Table 5-1
RECOMMENDED LAND USE COMPATIBILITY APPROACHES FOR FOCUS AREAS (Contd')**

FORT HUACHUCA JOINT LAND USE STUDY (JLUS)					
Focus Area	Primary Mission(s)	Jurisdictions	Existing Compatibility Measures	Potential Compatibility Approaches	JLUS Recommendations³²
2. Restricted Airspace	Flight training (including low-level) training for DoD units. Aircraft include F-16, A-10 and C-130. Testing and training involving UAVs	Cochise County Sierra Vista Huachuca City Pima County Santa Cruz County Patagonia	Arizona Statute (effective Feb 2007) requiring notification of location within restricted airspace to purchasers of property	<ul style="list-style-type: none"> ○ Limitations on Density / Intensity of Future Development ○ Enhanced Local Notification Measures ○ Installation Review of Development Proposals Requiring Discretionary Action (e.g. rezoning, special use), including consideration of an Overlay Notification Zone 	<ul style="list-style-type: none"> ○ Notification Measures (i.e. Uses within the area of the Restricted Airspace are Subject to Overflights) <ul style="list-style-type: none"> - Signage Along Major Roadways - Formal notice to purchasers of property and tenants - Recorded on Property Deeds ○ Formal Procedures for Installation Review of Major Development Proposals (e.g. Rezoning, Special Uses, Master Plans) ○ Formal Procedures for Installation Review of Arizona State Lands major actions within the Restricted Airspace.

**Table 5-1
 RECOMMENDED LAND USE COMPATIBILITY APPROACHES FOR FOCUS AREAS (Contd')**

FORT HUACHUCA JOINT LAND USE STUDY (JLUS)					
Focus Area	Primary Mission(s)	Jurisdictions	Existing Compatibility Measures	Potential Compatibility Approaches	JLUS Recommendations ³²
3. Hubbard Assault Strip	Tactical Training conducted with C-130 four-engine transport aircraft includes low-level flight and nighttime Night Vision Goggle training. Four parachute "drop zones" also involving low-level flights.	Cochise County	Babocomari Area Plan polices for Hubbard Encroachment Area include: <ul style="list-style-type: none"> ○ Density limited to 1 DU / 3 acres in Southern Part ○ Notification for Property Buyers Cochise County Light Pollution Code	<ul style="list-style-type: none"> ○ Additional Local Notification Measures (e.g. Signage) ○ Include Notification Measures in Whetstone Community Plan ○ In Whetstone Community Plan, include Rural Residential LU Designation for Hubbard Approach Area 	<ul style="list-style-type: none"> ○ Additional Notification Measures (e.g. notification signage) in Babocomari Area ○ In Whetstone Community Plan: <ul style="list-style-type: none"> - Include Notification Measures - Include Rural Residential Land Use Designation for Hubbard Approach Area

**Table 5-1
 RECOMMENDED LAND USE COMPATIBILITY APPROACHES FOR FOCUS AREAS (Contd')**

FORT HUACHUCA JOINT LAND USE STUDY (JLUS)					
Focus Area	Primary Mission(s)	Jurisdictions	Existing Compatibility Measures	Potential Compatibility Approaches	JLUS Recommendations³²
4. Libby Army Airfield	Flying mission, including operations of aircraft from Davis-Monthan AFB, Tucson AANG, and other DoD units. Operations of UAVs.	Cochise County Santa Cruz County Sierra Vista Huachuca City (Territory in the Vicinity of a Military Airport only)	Arizona Revised Statutes providing for: <ul style="list-style-type: none"> o Notification and Sound Attenuation within Territory in Vicinity of Military Airport o Prohibition of Certain Uses in High Noise / Accident Potential Zones City of Sierra Vista Airport Airspace Zone providing for height and obstruction restrictions	<ul style="list-style-type: none"> o Additional Notification Measures (e.g. Signage) particularly in the paddle area o Coordination of Future Land Use Planning between Installation and Landowners in southeastern part of the "High Noise and Accident Potential Zone" 	<ul style="list-style-type: none"> o Additional Notification Measures (e.g. Signage) o Coordination of Future Land Use Planning between Installation and Landowners in Southeastern Part of the Eastern Paddle and in Northwestern Part of the Western Paddle
5. Black Tower Complex	UAV Flight Operations for Testing and Training	Cochise County		<ul style="list-style-type: none"> o Limitations on Density / Intensity of Future Development in "Hot Spots" (areas of frequent overflights) o Enhanced Local Notification Measures o Installation Review of Development Proposals Requiring Discretionary Action (e.g. rezoning, special use), including consideration of an Overlay Notification Zone 	<ul style="list-style-type: none"> o Limitations on Density / Intensity of Future Development in "Hot Spots" o Enhanced Local Notification Measures o Formal Procedures for Installation Review of Development Proposals Requiring Discretionary Action (e.g. Rezoning, Special Use)

**Table 5-1
RECOMMENDED LAND USE COMPATIBILITY APPROACHES FOR FOCUS AREAS (Contd')**

FORT HUACHUCA JOINT LAND USE STUDY (JLUS)					
Focus Area	Primary Mission(s)	Jurisdictions	Existing Compatibility Measures	Potential Compatibility Approaches	JLUS Recommendations³²
6. Willcox Playa	Testing and Training Involving Electronic Equipment	Cochise County Willcox	“Coordination Zone” requiring notification of Installation for Federal activities with Potential electromagnetic interference (under NTIA requirements).	<ul style="list-style-type: none"> ○ Installation Review of Development Proposals Requiring Discretionary Action (e.g. rezoning, special use), including consideration of an Overlay Notification Zone 	<ul style="list-style-type: none"> ○ Formal Procedures for Installation Review of Development Proposals Requiring Discretionary Action (e.g. Rezoning, Special Use)
7. Sunnyside	Testing and Training Involving Electronic Equipment	Cochise County	NTIA Compatibility Zones for Federal Activities including “Noise Minimize Zone” extending for 24 k around the Installation and a “Coordination Zone” within which the Installation must be notified of Federal activities that could cause electromagnetic interference.	<ul style="list-style-type: none"> ○ Installation Review of Development Proposals Requiring Discretionary Action (e.g. rezoning, special use), including consideration of an Overlay Notification Zone ○ Encourage DoD Involvement in buy-out of inholdings, including possible DoD / Forest Service Land Swap ○ Use of Voluntary Conservation Land Trusts (agricultural or otherwise) ○ Encourage continued agricultural and low-intensity use 	<ul style="list-style-type: none"> ○ Formal Procedures for Installation Review of Development Proposals Requiring Discretionary Action (e.g. Rezoning, Special Use, Master Plans) ○ DoD Involvement in Acquisition of Inholdings (including DoD / USFS Land Swap) ○ Voluntary Land Conservation Trusts ○ Encourage Continued Agricultural / Low-Intensity Use



6. IMPLEMENTATION PROGRAM

6.1 INTRODUCTION

This Fort Huachuca JLUS is intended to guide the decisions made by a variety of public and private entities in relation to compatible land use in the Electronic Range and Restricted Airspace. In addition to the State of Arizona and its agencies, the Fort, local jurisdictions, and private interests within the area can contribute to the implementation of the recommendations of the JLUS.

Chapter 5 of this JLUS defines compatibility approaches that are intended to guide development in order to maintain the operational capabilities of the Fort, while facilitating the economic development of other key sectors in ways that are compatible with the Fort's critical mission. Implementation of the Compatible Approaches is fundamental to achieving these goals and integration of land use recommendations into general and comprehensive plans and zoning ordinances is a key element in implementing the JLUS. However, successful implementation requires that other tools be utilized to achieve the JLUS goals. These tools are contained in the implementation program presented in the following sections.

The implementation program has been developed recognizing the ongoing cooperation by the Fort and local jurisdictions, as well as considering the divergent viewpoints expressed through the project's process, and the need to present strategies that realistically accomplish the goal of maintaining the operational capabilities of the Fort. While the changing nature of technology, economics and politics may change the scope and timing of the implementation strategies, these recommendations provide the framework and guidance for achieving long-term compatibility of development with continued military operations.

The following sections present the recommended Implementation Strategies. Three aspects of implementation that are integral to the process follow a brief description of each strategy. The first aspect of implementation, **Priority / Timing**, establishes the importance of the action and the timeframe within which the Strategy is to be effected as follows:

- High — by June 2008;
- Moderate — within 2–3 years, that is by June 2010;
- Low — 4–5 years, that is by June 2012.

The second aspect of implementation, **Responsible Party(s)**, indicates the governmental agency, local political jurisdiction, and other parties responsible for implementing the Strategy. The third aspect of implementation, **Evaluation Measures**, presents recommendations concerning review and monitoring to facilitate adjustments if the strategy is not meeting its desired results. One of the appropriate functions for the State would be to monitor the implementation and effectiveness of the recommended measures through the Arizona Department of Commerce or other State agency.

6.2 IMPLEMENTATION STRATEGIES

6.2.1 Joint Land Use Study Recognition

While the JLUS is not adopted in the traditional sense by local jurisdictions and is not a legal document, the local jurisdictions as well as the Fort should recognize the completion of the JLUS and its status as guidance for land use decisions in the vicinity of the Fort. Appendix B contains a model resolution for consideration by the Town, Cities and Counties.

- Priority / Timing – High
- Responsible Party(s) – Town, Cities and Counties and Fort Huachuca
- Evaluation Measures – Resolution or similar official acknowledgement adopted in 2007

6.2.2 Revision of Local Plans

The JLUS study defines compatibility approaches for the critical areas around Fort Huachuca. The General Plans, Comprehensive Plans and ordinances are the primary means of implementing the recommended compatible uses. The local jurisdictions should review their respective plans to identify changes that would implement the compatibility approaches and prepare necessary amendments to the plans for consideration and adoption by their respective governing bodies. Each plan should contain policies that provide that the Town / City / County will cooperate with Fort Huachuca to encourage compatible land use, help prevent incompatible encroachment, and facilitate the continued presence of this military installation and the economic base that it provides. The plans also should contain maps of the Fort Huachuca Focus Areas or Areas of Influence. Based upon future technical studies conducted by the Fort to define compatibility criteria for electromagnetic interference, the local jurisdictions should consider developing Spectrum Policies and Spectrum Management Objectives to guide land use decisions and users of the radio and electromagnetic spectrum in the area of influence of Fort Huachuca.

- Priority / Timing – High
- Responsible Party(s) – Town, Cities and Counties.
- Evaluation Measures – Adopted Plan and Zoning Ordinance amendments

6.2.3 Coordination with the Governor’s Military Affairs Commission

The Military Affairs Commission, created by Executive Order in March 2004, is the permanent body to monitor and make recommendations to the Governor on executive, legislative and federal actions necessary to sustain and grow Arizona’s network of military installations, training and testing ranges and associated airspace. Creation of the Military Affairs Commission (MAC) was a recommendation of the Governor’s Military Facilities Task Force in its Report of December 2003. Other recommendations of the Task Force, including the designation of dedicated funding to assist military installation preservation and expansion projects have been implemented by legislative action. The Town Cities and Counties, along with interested community and civic organizations should be actively involved in coordinating their activities related to Fort Huachuca with the Military Facilities Commission, and support implementation of its recommendations at the State

level. Of particular importance for Fort Huachuca is the revision of the priorities for determining which applications through the Military Installation Fund (MIF) will be approved. (See Strategy 6.2.9.) The need for this revision should be presented to the MAC for its consideration and recommendation that the MIF rules concerning priorities be revised.

- Priority / Timing – High
- Responsible Party(s) – Town, Cities, Counties and other organizations
- Evaluation Measures – Development of coordination mechanisms and presentation of need for revised MIF priorities.

6.2.4 Support for State Trust Land Reform

The ability for the State Trust to engage in land exchanges and the ability to transfer densities and land uses between various State Trust lands is potentially an important element for achieving compatibility in the development of State Trust lands in the JLUS study area. Although the most recent attempt to provide this important tool through a constitutional amendment in the November 2006 election was not approved, it is likely that there will be support in the future measure to provide for such transfers. As any future mechanism to allow this will likely require legislative action and / or a vote of the electorate to modify the State Constitution, the local jurisdictions around Fort Huachuca and other interested organizations should actively support efforts to develop and adopt such a mechanism.

- Priority / Timing – High
- Responsible Party(s) – Town, Cities, Counties and other organizations
- Evaluation Measures – Enactment / adoption of measures to allow transfer of State Trust lands around military installations

6.2.5 Ongoing Coordination for JLUS Implementation

Efficient and effective communication between the local jurisdictions,, area landowners, other local organizations and Fort Huachuca is critical to the successful implementation of the JLUS. To provide a means to maintain communication and coordination as the JLUS recommendations are carried out, the local jurisdictions and military installations should consider the joint designation of an ongoing coordinating body. This body, which could be an existing organization such as the Fort Huachuca JLUS PAC Policy Advisory Committee, should be comprised of representatives from a broad stakeholder base including area landowners and other local organizations that have an interest in compatible land use around the Fort. This body could also serve as the interface with the State Military Affairs Commission on issues related to Fort Huachuca. This body would facilitate the implementation of JLUS recommendations and should issue a report on an at least annual basis that provide the status of implementation efforts as well as updates to information and JLUS components such as focus area boundaries.

- Priority / Timing – High

- Responsible Party(s) – Towns, Cities, Counties, Fort Huachuca, area landowners and other local organizations
- Evaluation Measures – Ongoing

6.2.6 Army Compatible Use Buffer (ACUB) Program

The Department of Defense (DOD) and the individual military departments, including the Department of the Army, are implementing a program of purchase of conservation easements around military installations in order to address environmental and encroachment issues.

The “Bob Stump National Defense Authorization Act” for Fiscal Year 2003 (P.L. 107-314) provided new statutory authority that permits the Department of Defense to enter into agreements with eligible entities to address the use or development of real property near a military installation, and to accept on behalf of the United States Government any property or interest acquired pursuant to such agreements. In general terms this authority includes the following specific elements.

Eligible entities are States, political subdivisions or private conservation organizations.

The amendment provides for the acquisition by an eligible entity of all right, title, interest in and to any real property, and sharing by the Government and the entity in acquisition costs. The amendment also requires the entity, upon request of the DOD, to transfer to the Government the minimum property or interests necessary to avoid encroachment from the use or management of the property.

Department of Defense funds may be used for such agreements for purchase from willing sellers. It is important to note that the amendment does not provide specific funding for these purchases. The Department of Defense will determine if, and how much funding will be available for this initiative.

The amendment also permits Department of Defense to convey surplus real property to states or other eligible entities for conservation of natural resources.

The Department of the Army is implementing the Army Compatible Use Buffer (ACUB) Program, and Fort Huachuca has received approval of its proposal for multi-year funding (beginning in FY06) to develop ACUB through acquisition of conservation easements around the installation training area perimeter, within the portion of the C4ISR testing range that surrounds Fort Huachuca, and within established aircraft over-flight restricted areas.

Fort Huachuca proposes to use the ACUB program in a phased approach to establish protective buffers around the installation training area perimeter while real property interests, specifically conservation easement, acquisition costs are relatively low. The proposed buffers would protect installation airfields and aircraft flight corridors by preventing incompatible land uses from occurring within designated high noise zones and aircraft over-flight areas; limit off-post ambient lighting and other obstructions that could interfere with Night Vision Device (NVD) training operations; preserve Open Air (to include the low ambient RF Environment) test capabilities; and reduce current and future Endangered Species Act encumbrances related to water use. As a secondary benefit, the buffers would allow for increased utilization of military training areas located near the

installation boundary including the proposed new convoy live fire (move and shoot) range to be located to the east of the existing impact area in Areas A and E, shooting into Area Z. Additionally, these buffers also protect key natural habitats, ecological systems, and the associated flora and fauna.

Fort Huachuca has a primary non-federal partner in this endeavor, The Nature Conservancy, which has proven experience in developing stakeholder partnerships and an excellent record of conservation property management. Fort Huachuca has worked successfully with The Nature Conservancy in the past to buy conservation easements from willing sellers to reduce regional groundwater pumping, reduce development potential and preserve traditional land use consistent with community land use plans. Fort Huachuca intends to continue to work with the Conservancy and other potential partners and landowners to execute the installation ACUB strategy.

- Priority / Timing – High
- Responsible Party(s) – Towns, Cities, Counties, Fort Huachuca, Department of the Army, The Nature Conservancy and other potential partners, and private landowners
- Evaluation Measures – Completed purchase of conservation easements

6.2.7 Department of Defense Land Acquisition

While the Army Compatible Use Buffer (ACUB) Program has a high priority for acquisition of development rights to promote compatibility around Fort Huachuca, direct acquisition of land through the Department of Defense is also a potential option that could be utilized in situations where use of the ACUB program is not feasible. Local jurisdictions along with the installations and other interested groups such as the Chamber of Commerce and Huachuca 50 could work with the State's Congressional delegation to obtain appropriations in the Department of Defense budget dedicated to the purchase of critical parcels to protect the Fort's mission.

- Priority / Timing – High to moderate
- Responsible Party(s) – Town, Cities, Counties, local organizations and the, Arizona Congressional delegation
- Evaluation Measures – Appropriated funding in the Department of Defense budget

6.2.8 Land and Water Conservation Fund

The Land and Water Conservation Fund (LWCF) was established by Congress in 1964 to create parks and open spaces, protect wilderness, wetlands, and refuges, preserve wildlife habitat, and enhance recreational opportunities. The LWCF has a matching grants program that provides funds to states for planning, developing and acquiring land and water areas for state and local parks and recreation areas. While these funds are limited in quantity, they could be used to match state monies to purchase critical parcels of land within the JLUS study area for use as conservation / open space.

- Priority / Timing – High to Moderate
- Responsible Party(s) – Town, Cities, Counties and Federal and State governments

- Evaluation Measures – Use of land and water conservation funds as appropriate

6.2.9 Military Installation Fund

One of the recommendations of the Governor’s Military Facilities Task Force was the creation of a Military Installation Fund (MIF), to be administered by the State and funded by dedicated revenue at the State level. The MIF, as established under ARS §41.1512.01, will provide grants to local governments for land acquisition or other activities to preserve or expand military installations. The City, Towns and Counties should consider use of MIF funding to support acquisition of land or development rights in critical areas (most likely in combination with other funding), or for other activities that would support compatible land use. As described under Strategy 6.2.3, the current MIF rules establish priorities for approval of applications for funding that favor acquisitions in high noise and accident potential areas around military airports. Changes in the priorities to allow priority for other factors, such as the survival of an installation’s mission, to be considered would allow the Fort to be more effective in obtaining funding from the MIF.

- Priority / Timing – High to Moderate
- Responsible Party(s) – Town, Cities and Counties and State of Arizona
- Evaluation Measures – Approval of application for use of MIF funds

6.2.10 Purchase of Development Rights

An alternative to the purchase of land is the purchase of development rights that would be negotiated with the owner of the development rights. In addition to the ACUB Program described in Strategy 6.2.6, other opportunities to promote compatible development through purchase of development rights may occur. Participation in the purchase of development rights would be voluntary on the part of the owner. This type of acquisition may be effective in appropriate situations and areas, particularly where the issue of compatibility involves density of development rather than the type of land use proposed. When development rights are purchased, a landowner is paid fair market value for the rights that are purchased. The value of the purchased rights is roughly equal to the value of the land without any special restriction less the value of the land with the land use restrictions. The use of this strategy would be dependent on securing funding for the purchase through one of the other strategies identified in this chapter.

- Priority / Timing – High to Moderate
- Responsible Party(s) – Federal government, State government, and local jurisdictions
- Evaluation Measures – Development Rights are purchased

6.2.11 Transfer of Development Rights

The use of Transfer of Development Rights (TDRs) can reduce the intensity and density of use in areas identified as significant to preserving the Fort’s mission while increasing density in other areas by encouraging local political jurisdictions to create incentives for developers to use the density transfer technique in appropriate situations and areas affected by aircraft operations. The transfer of development rights is similar to the

purchase of development rights, except rather than a public agency buying development rights, which are then in effect “retired”, the landowner is compensated by having the permitted uses of other land expanded or intensified. The land to which the rights are transferred may be owned either by the landowner, or by someone else. In the latter case, compensation is paid to the “sending” landowner by the “receiving” landowner. Participation in TDR programs would be voluntary on the part of the landowner(s). Under the TDR scenario, the use of land currently zoned for lower intensity use outside the affected areas could be modified to allow higher density development at the same time the use of land in the affected areas currently zoned to permit higher density development would be restricted to lower density use.

- Priority / Timing – High to Moderate
- Responsible Party(s) – Local jurisdictions
- Evaluation Measures – TDR programs are adopted by the local jurisdictions

6.2.12 Partnerships with Non-Governmental Organizations to Facilitate Transfers of Development Rights

Governmental or non-governmental entities such as the Trust for Public Land (TPL) or the Nature Conservancy, may acquire and / or hold development rights for land adjacent to a military installation or facility, dedicating it to uses compatible with military missions or to transferring those lands to public ownership for conservation or open space uses. The Nature Conservancy is a partner for Fort Huachuca in the Army Compatible Use Buffer (ACUB) Program and has previously worked with Fort Huachuca to acquire conservation easements. TPL also has a program to assist communities in pursuing a preservation ballot initiative, providing services that include political analysis and campaign strategy.

- Priority / Timing – High to Moderate
- Responsible Party(s) – Local jurisdictions, Fort Huachuca and Nature Conservancy, TPL or other entity
- Evaluation Measures – Acquisition of development rights by TPL or other entity

6.2.13 Enhanced Local Notification and Disclosure

In response to recommendations of the Governor’s Military Facilities Task Force the Arizona Department of Real Estate has developed policies to strengthen and standardize the notification process for its licensees and to require notification to purchasers of property affected by military operations such as high noise and accident potential zones and overflights in the vicinity of military airports and within restricted airspace. Increasingly, communities have determined that there is value to their citizens in going beyond the minimum public notification and disclosure standards outlined in State law. Potential mechanisms to enhance public notification and disclosure that could be considered by local jurisdictions include:

- Requiring notices and maps to be posted in real estate sales and leasing offices, including identification of noise contours.

- Requiring notices placed in model home complexes and sales offices advising potential buyers that the area is subject to military aircraft over flight and potential EMI.
- Requiring release of liability language on all recorded subdivision plats.
- Installing over flight signage at roadway intersections within the noise contour lines.

Experience has shown that notification is highly effective in educating nearby residents about the presence of military activities and avoiding complaints.

- Priority / Timing – High to Moderate
- Responsible Party(s) – Town, Cities and Counties
- Evaluation Measures – Enhanced Notification and Disclosure procedures in place

6.2.14 Best Practice Techniques

A process to assess the usefulness of various techniques used by other political jurisdictions with similar military air base encroachment issues is an effective means to ensure that the “best practices” are being used to guide development around the State’s military facilities. Results of the Best Practices research have been compiled into the State Policy Guidebook developed as part of the statewide effort by the Department of Commerce to address land use compatibility and encroachment issues under the Arizona Military Regional Compatibility Project. The Department of Commerce, in cooperation with the military installations, local jurisdictions and other stakeholders in the State, should continue to investigate and evaluate techniques used in other States to achieve compatibility, and assess their applicability to Arizona’s needs. The Department should periodically update the Policy Guidebook to reflect the results of the ongoing assessment.

- Priority / Timing – Ongoing
- Responsible Party(s) – State government, local jurisdictions, and other stakeholder groups
- Evaluation Measures – Ongoing assessment of the State Policy Guidebook and revisions as needed.

6.2.15 Installation Review of Major Development Proposals

Because operations of Fort Huachuca’s Electronic Range and operations within the Restricted Airspace cover extensive areas outside the Fort’s boundaries, input from the Fort to local jurisdictions on major development proposals is desirable in order to be able to address potential compatibility issues at an early stage in the development process. To a large extent, this is being done now as a matter of general practice by the local jurisdictions, including Sierra Vista, Huachuca City and Cochise County; however, there are no formalized procedures for obtaining the Fort’s input on major development proposals. To ensure that the ability for the Fort to provide input is consistent throughout the area of the Electronic Range and Restricted Airspace, each of the local jurisdictions should include, as part of the formal procedures for processing development application, a requirement that the proposed development be referred to the Fort for their review and

comment; the Fort should designate a single point of contact to receive the submittals and be responsible for transmitting the Fort's responses to the local jurisdictions. The intent of the installation review would be to provide the local jurisdictions with input on the proposed development's compatibility with the Fort's operations, and that the input be considered by the local governing bodies in their decision-making process.

The following would be considered as major development proposals: General Plan amendments; zoning amendments; special use permits; and approvals of Community Plans or Master Plans or their equivalent. The areas within which major developments would be referred to the Fort are defined by the JLUS study area, which includes the Electronic Range and Restricted Airspace Focus Areas (see Figure 2-1). In addition to these areas, a similar process should be established for Willcox Playa; because a Focus Area has not yet been defined around Willcox Playa, the Fort and local jurisdictions (Cochise County and, potentially, the City of Willcox) should jointly identify an appropriate area around the Playa for referral of development proposals.

The local jurisdictions should also consider developing a mechanism so that public and private infrastructure extensions within the area of influence of Fort Huachuca (using the JLUS study area as the starting point) are subject to coordinated review as they relate to current and future capacity needs of the military installation, as well as issues of growth inducement created by extension and expansion of infrastructure capacity.

- Priority / Timing – High
- Responsible Party(s) – Fort Huachuca and Local Jurisdictions
- Evaluation Measures – Implementation of procedures for referral of major development proposal to Fort Huachuca

6.2.16 Notification of State Lands Department Actions

Extensive areas of State Trust Lands exist within the Fort's Electronic Range and Restricted Airspace. In order to provide an opportunity for the Fort to have input on potential compatibility issues related to development of these lands at an early stage, implementation of a process is recommended for the State Lands Department to notify Fort Huachuca when certain actions concerning State Trust Lands are proposed to be undertaken within areas of interest for the Fort's Electronic Range and Restricted Airspace. Actions for which the Fort would be notified are: development of Conceptual Land Use Plans through the Urban Lands Oversight Committee; offering of lands for sale; new leases or changes in leases that involve a change in land use; or new rights-of-way or changes in existing rights-of-way.

The notification areas to be used by the State Lands Department would be defined by the JLUS study Area delineated in Chapter 2 of this JLUS for the Electronic Range, and by the Restricted Airspace as currently mapped by the Arizona Department of Real Estate. The Fort would designate a single point of contact to receive the notifications and be responsible for transmitting the Fort's responses to the State Lands Department.

- Priority / Timing – High
- Responsible Party(s) – State Land Department, Fort Huachuca and Local Jurisdictions

- Evaluation Measures – Implementation of procedures for Fort Huachuca notification of State Land Department actions

6.2.17 Studies to Define / Refine Compatibility Criteria for the Electronic Range

As discussed in Chapter 5 of this JLUS, the potential for electromagnetic interference interfering with military operations has not been studied to the same extent as encroachment of incompatible uses related to safety or noise considerations. Therefore, it will be necessary to conduct the detailed technical studies necessary to understand the current electromagnetic environment in which Fort Huachuca operates, including both radiated susceptibility and radiated emissions. These studies should provide a basic framework for understanding the physical and spatial relationships of Fort Huachuca operations within the context of the existing built and natural environment. Determination of available frequency spectrum capacity for training and developmental/operational testing activities should be completed. Identification of any existing spectrum limitations should also be known. The studies should make recommendations for keeping information current as well as on-going monitoring protocol. As part of the studies, the Fort should determine the feasibility of accessing resources of the Department of Defense's Joint Electromagnetic Environmental Effects Program which might provide assistance in quantifying the electromagnetic capacity needs of Fort Huachuca, as well as defining protections to prevent electromagnetic interference.

A related study should be considered to evaluate the effect of personal wireless service (PWS) on the electromagnetic environment. Such a study could establish a baseline of understanding the current PWS environment in the vicinity of Fort Huachuca by identifying the providers of PWS and the current network of personal wireless services within the MIIA, including current PWS capacity at existing population centers; current and future transportation corridors for PWS; the areas of variable topography which impact the line of sight requirements for PWS; and existing concentrations, by number and location of PWS telecommunications sites and frequencies (MHz). This knowledge could be incorporated into land use planning decisions in the vicinity of the Fort.

- Priority / Timing – High
- Responsible Party(s) – Fort Huachuca, with potential support from other organizations, such as Huachuca 50.
- Evaluation Measures – Completion of necessary technical studies and definition of specific electromagnetic compatibility criteria.

6.2.18 Support for Changes in County Authority to Control Lot Splits

Under existing State Statutes, counties in Arizona have relatively limited ability to control lot splits. With the continuing demand for a rural or "exurban" lifestyle in the state, the development of residential parcels through lot splits in locations adjacent to military installations creates potential problems of compatibility. Jurisdictions in the vicinity of military installations should support legislation to allow counties to exercise the same degree of control over lot splits in the vicinity of a military installation as they would over subdivisions as defined in State Statute.

- Priority / Timing – High

- Responsible Party(s) – Town, Cities, Counties and other organizations
- Evaluation Measures – Enactment / adoption of measures to allow counties to control lot splits in the vicinity of Fort Huachuca as they would subdivisions.



APPENDIX A: ARIZONA LAND USE COMPATIBILITY LEGISLATION

To view the full text of the Arizona Revised Statutes (ARS) discussed below visit the Arizona State Legislature's web site at www.azleg.state.az.us/ArizonaRevisedStatutes.asp.



APPENDIX B: ARIZONA REGIONAL COMPATIBILITY PROJECT MODEL RESOLUTION

The following is a model resolution for Council or Board adoption of the JLUS. This should not be construed as legal advice, as it is advisable to consult with your jurisdiction's legal advisor on specific language for adoption.

ARIZONA REGIONAL MILITARY COMPATIBILITY PROJECT – JOINT LAND USE STUDY MODEL RESOLUTION

A resolution expressing the will of the Mayor and Council (Board of Supervisors) of *[Insert Community Name Here]* to protect the public health, safety, and welfare of citizens in the vicinity of Fort Huachuca and maintain a strong collaborative partnership with Fort Huachuca to maintain the operational viability of this critical military facility.

Whereas we, the Mayor and Council (Board of Supervisors) of the City (Town) (County) of *[Insert Community Name Here]* in our elected posts are charged with a responsibility to protect the public health safety and welfare of *[Insert Community Name Here]* citizens and,

Whereas land within the jurisdiction of the City (Town) (County) of *[Insert Community Name Here]* falls within an area of operations at Fort Huachuca and,

Whereas as growth occurs, the City (Town) (County) of *[Insert Community Name Here]* commits to working diligently towards ensuring the development of land uses compatible with the long-term sustainability of operations at Fort Huachuca and,

Whereas recommended implementation strategies have been defined by the Fort Huachuca JLUS, therefore,

Be it resolved, that we the Mayor and City (Town) Council (Board of Supervisors) of *[Insert Community Name Here]* will protect the public health, safety and welfare by consideration of these aspects as decision-making components in all discretionary development decisions.

Be it also resolved therefore, that City (Town) (County) staff shall provide early and salient notification to Fort Huachuca on all discretionary development approval requests within the Focus Areas designated in the Fort Huachuca JLUS.

Be it also resolved that City (Town) (County) staff will incorporate the comments from the installation for formal consideration by the Planning Commission and City (Town) Council (Board of Supervisors) in the approval process.

Be it finally resolved therefore, that we, the Mayor and Council (Board of Supervisors) of *[Insert Community Name Here]* shall work towards the implementation of recommendations contained within the Joint Land Use Study (JLUS) for Fort Huachuca, shall integrate the recommended JLUS into its General (Comprehensive) Plan, and shall

**ARIZONA REGIONAL MILITARY COMPATIBILITY PROGRAM
FORT HUACHUCA JOINT LAND USE STUDY**

consider this information in the deliberation of all discretionary development approval requests.

Resolved this day of _____, 200____.



APPENDIX C: GLOSSARY OF ACRONYMS

A

AAF - Libby Army Airfield

AB – Assembly Bill

ADOC – Arizona Department of Commerce

ADOT – Arizona Department of Transportation

AFAF – Air Force Auxiliary Field

AFB - Air Force Base

AGL – Above Ground Level

AICUZ – Air Installation Compatible Use Zone

APZ – Accident Potential Zone

ARS – Arizona Revised Statutes

ASP - Arizona State Parks

B

BLM – Bureau of Land Management

BOR – Bureau of Reclamation

BRAC – Base Realignment and Closure

C

C4I - Command & Control, Communications, Computers, and Intelligence

CC&Rs – Covenants, Conditions & Restrictions

COMSEC - Army Wholesale Inventory Manager of Communications Security

CSLA - United States Army Communications-Electronics Command Communications Security Logistics Activity

CZ – Clear Zone

D

dB – Decibel

dBA – A-weighted Decibel

dBC – C-weighted Decibel

DISA - Defense Information Systems Agency

DOD – Department of Defense

E

EPA – Environmental Protection Agency

EPG - United States Army Electronic Proving Ground

ESRI – Environmental Systems Research Institute

F

FAA – Federal Aviation Administration

FW – Fighter Wing

G

GADA – Greater Arizona Development Authority

GIS – Geographic Information System

H

HFEA - Hubbard Field Encroachment Area

I

ICAO – International Civil Aviation Organization

IEWTD - Intelligence and Electronic Warfare Testing Directorate

ILS – Instrument Landing System

INM – Integrated Noise Model

J

JITC - Joint Interoperability Test Command

JLUP – Joint Land Use Plan

JLUS – Joint Land Use Study

L

Ldn – Day-Night Average Sound Level

LWCF – Land and Water Conservation Fund

M

MAG – Maricopa Association of Governments

MCAS – Marine Corps Air Station

MIF – Military Installation Fund

MSL – Mean Sea Level

MTR – Military Training Route

N

NAS – National Airspace System

NATO – North Atlantic Treaty Organization

NETCOM/9th ASC - United States Army Network Enterprise Technology Command/9th Army Signal Command

NCA - National Conservation Area

NCO - Noncommissioned Officer

NLR – Noise Level Reduction

NPS - National Park Service

NTIA - National Telecommunications and Information Administration

O

OTC - Operational Test Command

P

PAC – Policy Advisory Committee

P.L. – Public Law

PUD – Planned Unit Development

R

RAPCON – Radar Approach Control

RASP – Regional Aviation Systems Plan

RMP – Resource Management Plan

S

SDC-H - Software Development Center-Huachuca

SUA - Special Use Airspace

T

TACAN – Tactical Air Navigation
TDR – Transfer of Development Rights
TPL – Trust for Public Land
TRACON – Terminal Radar Approach Control

U

UAV – Unmanned Aerial Vehicle
UAS – Unmanned Aerial System
UASTB - Unmanned Aerial System Training Battalion
USAIC - United States Army Intelligence Center
USFS - United States Forest Service

V

VFR – Visual Flight Rules



APPENDIX D: RESOURCES CONSULTED

Arizona State Land Department Geographic Information Systems (GIS) Database. Public Land Ownership Information. Accessed January – April, 2007.

The Society for Risk Analysis, Risk Glossary, accessed at <http://www.sra.org>, July 16, 2003.

U.S. Air Force. Air Installation Compatible Use Zone Program. 1994.

_____. HQ USAF. Air Installation Compatible Use Zone (AICUZ) Handbook, Volumes I, II, and III. 1992.

U.S. Department of Defense. DOD Instruction 4165.57, Air Installations Compatible Use Zones. 1977.

_____. Joint Land Use Study: Program Guidance Manual. 1993.